
3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following sections describe the affected environment for each primary natural and human resource component, and the environmental consequences of the Proposed Action and the alternatives being considered in detail in this EIS. In some instances, mitigation measures are recommended to reduce or avoid identified impacts. For purposes of this analysis, it is assumed that the Wanapa Energy Center applicants would apply for, and receive state and federal approvals that require submittal of certain applications and associated environmental protection plans. A list of these approvals is presented in Tables 1.5-1 and 1.5-2. Some of the mitigation measures included in this EIS provide guidance on needed information, or applicant commitments in applications to various agencies.

3.1 No Action Alternative

If the Wanapa Energy Center were not constructed and operated, the predicted effects on natural and human resources would not occur. It is likely that another electrical generating project would be constructed in the region in the near future, based on expected future regional demand for electricity. However, the location and effects of such a project cannot be accurately estimated at this time. The effects of the No Action alternative (no new project) in relation to existing conditions and trends are described briefly below.

Geology and Soils. No new surface disturbance would occur in the proposed project locations between the Columbia River and Cold Springs Reservoir, and consequently, no changes in existing wind and water soil erosion rates would occur, subject to seasonal fluctuations in precipitation and winds.

Water Resources. No new project water demands from the Columbia River would occur at the McNary Dam, and therefore, the flow regime in this reach of the River would remain the same, subject to climatic variations and existing approved water withdrawals. No new water would discharge to Cold Springs Reservoir, and therefore, the water quality and quantity in this reservoir would be maintained under existing storage and irrigation supply agreements.

Vegetation. No new surface disturbance would occur in the proposed project locations between the Columbia River and Cold Springs Reservoir, and therefore, native vegetation communities would continue to dominate in areas where they have not already been converted to agricultural

uses. It is anticipated that invasive weeds would continue to spread into native vegetation communities over time. Ongoing efforts to restore upland native vegetation on the Wanaket Wildlife Area may expand the area and quality of shrub scrub and grassland communities.

Fisheries. No new project water demands from the Columbia River, or water discharges to Cold Springs Reservoir would occur. Therefore, no fish habitat changes in the Columbia River, or Cold Springs Reservoir would occur.

Wildlife. No new surface disturbance would occur in proposed project locations between the Columbia River and Cold Springs Reservoir, and therefore, the wildlife habitat support capacities within native vegetation communities and roadside weedy communities would not change for big game, non-game, and wetland (amphibians, waterfowl, and shorebirds) species.

Special Status Species. No new surface disturbance would occur in the proposed project locations between the Columbia River and Cold Springs Reservoir, and no new water withdrawals from the Columbia River would occur. Therefore, there would be no changes in habitat carrying capacities for special status terrestrial and aquatic species.

Air Quality. No new project natural gas-fired air pollutant emission sources in the eastern Columbia River Basin would be constructed. Therefore, existing power generation emissions, and emissions from other sources (gas and diesel engine vehicles, fugitive dust, agricultural field burning) would continue at current rates.

Transportation. There would be no new requirements for transporting construction equipment, construction materials, and construction personnel along Interstate Highways, State Highway 730, and county roads that would provide access to the proposed construction areas for the proposed plant site and ancillary facilities.

Visual Resources. No new above-ground facilities would be constructed, and therefore, there would be no landscape changes apparent to residents and recreational users on the Columbia River near McNary Dam, or to drivers along State Highway 730.

Noise. No new noise-generating facilities would be constructed, and therefore, the existing rural background noise environment would remain the same.

Cultural Resources. *No new surface disturbance would occur in the proposed project locations between the Columbia River and Cold Springs Reservoir, and therefore, there would be no new impacts to cultural resources.*

Land Use. *No new above-ground or underground facilities would be constructed in the proposed project locations between the Columbia River and Cold Springs Reservoir. As a consequence, there would be no changes in current land uses, or effects on adjacent land uses.*

Recreation. *No new above-ground or underground facilities would be constructed in the proposed project locations between the Columbia River and Cold Springs Reservoir. As a consequence, there would be no changes in access to developed or dispersed recreation sites, or changes in the character of these types of recreational sites.*

Socioeconomics. *No new above-ground or underground facilities would be constructed in the proposed project locations between the Columbia River and Cold Springs Reservoir. As a consequence, there would be no short-term costs or benefits from the construction work force on local economics, no long-term benefits to the CTUIR from tribal taxes on the power plant, to local economies in the form of taxes paid directly by project facilities located on private and state lands, or indirectly to CTUIR from purchases of goods and services from the local economy.*

Public Safety. *No new above-ground or underground facilities would be constructed in the proposed project locations between the Columbia River and Cold Springs Reservoir. As a consequence, there would be no change in the existing public safety risks.*

3.2 Land Resources

3.2.1 Affected Environment

3.2.1.1 Geology and Geologic Hazards

The Draft EIS prepared for the Umatilla Generating Project (BPA 2001) provides a comprehensive summary of the underlying geology and geologic hazards for the vicinity of the McNary Substation on the Columbia River. As a consequence, this EIS tiers from the agency approved analysis contained in the Umatilla document. The following is a brief summary of the major findings of the Umatilla EIS:

- The region traversed by the Columbia River in eastern Oregon is underlain by deep (500 feet) deposits of basalt, a very erosion-resistant volcanic rock. Sands, silts, and gravels deposited by a massive flood, and lakes caused by debris dams in glacial times (13,500 to 15,000 years ago) occupy the surface of the basalt. These sands are currently developed for agriculture. Areas where the bedrock is exposed cannot be farmed because of a lack of soil.
- Four earthquakes with magnitudes on the Modified Mercalli Scale of V to VII (V = noticeable, but little structural damage; VII = some structural damage in poorly built or badly designed structures) have been recorded since 1872.
- No soil-related instability, landslides, ground-shaking, liquefaction, surface rupture, or subsidence hazards were identified that would require special structural design considerations beyond those included in the Oregon Structural Specialty Code. The risk to facilities from ash falls from a volcanic event was considered very low.

3.2.1.2 Soils

Soil types within the project area were identified using information in the NRCS soil survey for Umatilla County (Johnson and Makinson 1988). In total, 14 soil names and 27 soil units are present within the project study area. **Table 3.2-1** provides a summary of the soil unit characteristics including susceptibility to water erosion. **Figure 3.2-1** shows the location of the various soil units within the overall project study area; **Figure 3.2-2** illustrates the location of soil units in relation to project components between the plant site and McNary Substation.

Table 3.2-1
Summary of Soil Units

| Map Symbol | Soil Units | Characteristics |
|-------------------|---|---|
| 1B | Adkins Fine Sandy Loam, 0 to 5 Percent Slopes | Deep, well-drained soil located on the terraces of the Columbia River. It consists of fine sandy loam that is generally used for irrigated crops or as rangeland. It has slight water erosion and moderate wind erosion hazard. It is considered prime farmland. |
| 1C | Adkins Fine Sandy Loam, 5 to 25 Percent Slopes | Same as Unit 1B except slopes are greater. It has moderate water erosion and moderate wind erosion hazard. |
| 2B | Adkins Fine Sandy Loam, Gravelly Substratum, 0 to 5 Percent Slopes | Deep, well-drained soil located on the terraces of the Columbia River. It consists of fine sandy loam in the upper 26 inches and very gravelly fine sandy loam in the lower part to about 60 inches. It has slight water erosion and moderate wind erosion hazard. It is considered prime farmland. |
| 2C | Adkins Fine Sandy Loam, Gravelly Substratum, 5 to 25 Percent Slopes | Same as unit 2B except slopes are greater. It has moderate water erosion and moderate wind erosion hazard. |
| 3A | Adkins Fine Sandy Wet Loam, 0 to 3 Percent Slopes | Deep, well-drained soil located in depressional areas on the terraces of the Columbia River. It consists of fine sandy loam that is used for irrigated crops, residential development, and wildlife. Wetness is caused by irrigation and canal seepage. It has slight water erosion and moderate wind erosion hazard. |
| 3C | Adkins Fine Sandy Wet Loam, 3 to 15 Percent Slopes | Same as Unit 3A except slopes are greater. It has moderate water erosion and moderate wind erosion hazard. |
| 14B | Burbank Loamy Fine Sand, 0 to 5 Percent Slopes | Deep, well-drained soil located on the terraces of the Columbia River. It consists of loamy sand that is generally used for irrigated crops, rangeland, residential development, and wildlife. It has slight water erosion and high wind erosion hazard. |
| 23 | Dune Land, 0 to 30 Percent Slopes | Deep, excessively drained soil on terraces that consist of fine sand, loamy sand, and sand. Uses include limited grazing and wildlife. It has slight water erosion and very high wind erosion hazard. |
| 47B | Koehler Loamy Fine Sand, 0 to 5 Percent Slopes | Moderately deep and somewhat excessively drained soil on the Columbia River terraces. It consists of loamy fine sand about 13 inches thick over a hardpan. Uses include irrigated crops, pasture, residential development, and rangeland. It has slight water erosion and high wind erosion hazard. |
| 74B | Quincy Fine Sand, 0 to 5 Percent Slopes | Deep, well-drained soil located on the terraces of the Columbia River. It consists of fine sand and loamy sand that is generally used for irrigated crops, rangeland, and residential development. It has slight water erosion and very high wind erosion hazard. |
| 75B | Quincy Loamy Fine Sand, 0 to 5 Percent Slopes | Similar to Unit 74B except that it contains more loamy sand. It has slight water erosion and high wind erosion hazard. |
| 75E | Quincy Loamy Fine Sand, 0 to 5 Percent Slopes | Similar to Unit 75B except that slopes are greater. It has slight water erosion and high wind erosion hazard. |
| 76B | Quincy Loam Fine Sand, Gravelly Substratum, 0 to 5 Percent | Deep, excessively drained soil consisting of loamy fine sand and fine sand in the upper 37 inches and very gravelly fine sand from 40 to 60 inches. It is used for irrigated crops, pasture, residential development, and rangeland. It has slight water erosion and high wind erosion hazard. |

Table 3.2-1 (Continued)

| Map Symbol | Soil Units | Characteristics |
|-------------------|--|---|
| 78B | Quincy Rock Outcrop Complex, 1 to 20 Percent Slopes | This unit located on the terraces of the Columbia River contains about 50 percent fine sand and 20 percent rock outcrop. Depth to bedrock is about 40 to 60 inches. It is used for rangeland and wildlife. It has slight water erosion and very high wind erosion hazard. |
| 85F | Rock Outcrop - Xeric Torriorhents Complex, 10 to 70 Percent Slopes | Soil is located on terrace scarps and foot slopes and consists of rock outcrop (about 50 percent) and fine sandy loam, silt loam, and rock fragments. Uses include rangeland and wildlife. It has high water erosion and high wind erosion hazard. |
| 87B | Sagehill Fine Sandy Loam, 2 to 5 Percent Slopes | Deep, well-drained soil located on the terraces of the Columbia River. It consists of fine sandy loamy sand that is generally used for irrigated crops, rangeland, residential development, and wildlife. It has slight water erosion and moderate wind erosion hazard. It is considered prime farmland. |
| 87C | Sagehill Fine Sandy Loam, 5 to 12 Percent Slopes | Same as Unit 87B except slopes are greater and it contains silt loam in lower substratum. It has moderate water erosion and moderate wind erosion hazard. |
| 88C | Shano Very Fine Sandy Loam, 7 to 12 Percent Slopes | Deep, well-drained soil on terraces that consists of very fine sandy loam and silt loam. Uses include irrigated crops and rangeland. It has moderate water erosion and moderate wind erosion hazard. |
| 88D | Shano Very Fine Sandy Loam, 12 to 25 Percent Slopes | Same as Unit 88C except slopes are greater. It has high water erosion and moderate wind erosion hazard. |
| 89C | Shano Silt Loam, 7 to 12 Percent Slopes | Deep, well-drained soil on terraces that consists of coarse silt loam. Basalt is present at about 40 to 60 inches. Uses include irrigated crops and rangeland. It has moderate water erosion and moderate wind erosion hazard. |
| 93B | Starbuck Fine Sandy Loam, 2 to 20 Percent Slopes | Shallow, well-drained soil located on the terraces of the Columbia River that consists of fine sandy loam and basal bedrock. Depth to bedrock is about 12 to 20 inches. It is used for pasture and rangeland, recreation, and wildlife. It has moderate water erosion and moderate wind erosion hazard. |
| 94A | Starbuck Rock Outcrop Complex, 0 to 5 Percent Slopes | This unit located on the terraces of the Columbia River contains about 55 percent very fine sandy loam and 25 percent rock outcrop (exposed basalt). Depth to bedrock is about 12 to 20 inches. It is used for pasture and rangeland, recreation, and wildlife. It has moderate water erosion and moderate wind erosion hazard. |
| 95B | Taunton Fine Sandy Loam, 1 to 7 Percent Slopes | Moderately deep, well drained soil on the terraces of the Columbia River that consists of fine sandy loam over a cemented hardpan. Depth to hardpan is about 20 to 40 inches. It is used for irrigated crops, rangeland, residential development, and wildlife. It has slight water erosion and moderate wind erosion hazard. |
| 119A | Wanser Loamy Fine Sand, 0 to 3 Percent Slopes | Deep, poorly drained soil in depressional areas on terraces of the Columbia River that consists of loamy fine sand and fine sand. It is used for irrigated crops, rangeland, residential development, and wildlife. It has slight water erosion and high wind erosion hazard. |

Table 3.2-1 (Continued)

| Map Symbol | Soil Units | Characteristics |
|-----------------------|---|--|
| 122B | Winchester Sand, 0 to 5 Percent Slopes | Deep, well drained soil on the terraces of the Columbia River that consists of sand loamy sand, and coarse sand. It is used for irrigated crops, rangeland, residential development, and wildlife. It has slight water erosion and very high wind erosion hazard. |
| 123B | Winchester - Quinton Complex, 0 to 5 Percent Slopes | Soil consists of about 50 percent Winchester sand and 35 percent Quinton loamy fine sand. Basalt is at a depth of about 35 inches in Quinton unit. Uses include irrigated crops, rangeland, pasture, and wildlife. It has slight water erosion and high wind erosion hazard. |
| 126A | Xerofluvents, 0 to 3 Percent Slopes | Deep, poorly drained soil on floodplains that consist of loamy sand, very cobbly loam, and gravelly loam. Uses include pasture and wildlife. It has slight water erosion and slight wind erosion hazard. |

Three soil units, Starbuck rock outcrop, Starbuck very fine sandy loam, and rock outcrop xeric torriorthents complex, contain bedrock in the form of basalt in the upper layers. The depth to bedrock varies from about 12 to 20 inches. The Starbuck soil units are located within the plant site and along portions of the natural gas supply/wastewater discharge pipeline and transmission line routes. The xeric torriorthents complex is located within the natural gas supply/wastewater discharge ROW for Alternatives 3 and 4. Two other units, Quincy rock outcrop complex and Adkins fine sandy loam, also contain bedrock at depths of about 40 to 60 inches. The Adkins fine sandy loam is located along the southern end of natural gas supply/wastewater discharge pipeline routes, while the Quincy rock outcrop complex is located along a portion of natural gas supply/wastewater discharge pipeline routes (Alternatives 1 and 2).

In general, most of the soil units are well drained and relatively dry most of the time. Two units, Adkins fine sandy loam (Units 3A and 3C) are wet due to seepage from canals and irrigation. Water is mainly present during the irrigation season.

Hazards associated with water and wind erosion vary for the soil units. In terms of water erosion, units exhibiting moderate rating include the Starbuck rock outcrop complex, Starbuck very fine sandy loam and Adkins fine sandy loam. Due to a prevalence of sand in many of the soil units, numerous soils are rated as high and very high wind erosion: Starbuck very fine sandy loam, Quincy fine sand, Quincy loamy fine sand (Units 75B and E), Wanser loamy sand, Winchester sand, and Burbank loamy fine sand. One or more of these soil units are located within the water supply pipeline route, natural gas supply/wastewater discharge pipeline routes, and electric transmission line routes.

3.2.2 Environmental Consequences and Mitigation

3.2.2.1 Geology and Geologic Hazards

The proposed plant site would be located entirely on basalt bedrock, with almost no overlying soil. Other facilities (pipelines, transmission lines) would be installed in basalt bedrock, or sandy soils that are generally not saturated and subject to subsidence or liquefaction. A field reconnaissance of the pipeline routes indicates that the proposed pipeline and transmission line alignments cross gentle slopes (less than 20 percent) and no active landslide terrain is present near any proposed components within the study area.

3.2.2.2 Soil

Soil Erosion from Surface Water Runoff

As shown in **Table 3.2-2**, the majority of the soils occupy slopes of 5 percent or less and show a slight water erosion rating. When considering an annual precipitation of less than 10 inches, runoff potential and water erosion would be minor for most of the project study area. Small areas have slopes from 5 to 25 percent with a moderate water erosion rating, as listed below. These areas could exhibit moderate erosion during or immediately after storm events.

- Water Supply Line¹ – Starbuck very fine sandy loam (2.6 acres);
- Natural Gas Supply/**Plant** Discharge **Water** Pipeline – Adkins fine sandy loam and Starbuck-rock outcrop (24.2 acres); and
- Electric Transmission Line - Starbuck very fine sandy loam (11.1 acres).

Construction of all project components would require measures for controlling soil erosion and sediment runoff. These measures would include:

- Temporary erosion and SWPPP (see Section 3.3, Water Resources, for additional information).
- Permanent erosion control measures such as waterbars and rock-lined drainages would be installed after construction of all project components within native plant communities.
- All disturbed areas would be revegetated and restored as part of the SWPPP.

By implementing erosion control measures, surface runoff and erosion rates would be comparable to undisturbed soils.

Recommended Mitigation Measures. No mitigation measures are required beyond the SWPPP measures to reduce erosion impacts.

¹ *Water supply line ROW would be utilized for potable water and sanitary sewer pipeline.*

Table 3.2-2
Acreage of Sensitive Soils for the Wanapa Energy Center Project
Project Area

| Soil Series | Map Symbol | Slope | Total Acres | Water Erosion Hazard | | Wind Erosion Hazard | | | Shallow -to- Bedrock | Rock in Subsoil | Prime Farmland |
|-------------------------------|------------|-------|-------------|----------------------|----------|---------------------|------|-----------|----------------------|------------------|----------------|
| | | | | Slight | Moderate | Moderate | High | Very High | | | |
| Plant Site | | | | | | | | | | | |
| Starbuck-rock outcrop | 94a | 0-5 | 47.0 | 0 | 47.0 | 47.0 | 0 | 0 | 47.0 | 47.0 | 0 |
| | | | | | | | | | | | |
| Water Supply Pipeline | | | | | | | | | | | |
| Quincy loam fine sand | 75e | 5-25 | 6.4 | 6.4 | 0 | 0 | 6.4 | 0 | 0 | 0 | 0 |
| Starbuck very fine sandy loam | 93b | 2-20 | 2.6 | 0 | 2.6 | 2.6 | 0 | 0 | 2.6 | 2.6 | 0 |
| Starbuck-rock outcrop | 94a | 0-5 | 11.3 | 0 | 11.3 | 11.3 | 0 | 0 | 11.3 | 11.3 | 0 |
| Water | -- | | <0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Acreage | | | 67.3 | 6.4 | 60.9 | 60.9 | 6.4 | 0 | 60.9 | 60.9 | 0 |
| | | | | | | | | | | | |
| Access Road | | | | | | | | | | | |
| Starbuck-rock outcrop | 94a | 0-5 | 4.3 | 0 | 4.3 | 4.3 | 0 | 0 | 4.3 | 4.3 | 0 |
| | | | | | | | | | | | |
| Gas/Water Discharge Pipelines | | | | | | | | | | | |
| Adkins fine sandy loam | 1b | 0-5 | 29.2 | 29.2 | 0 | 29.2 | 0 | 0 | 0 | 0 | 29.2 |
| Adkins fine sandy loam, wet | 3a | 0-3 | 8.5 | 8.5 | 0 | 8.5 | 0 | 0 | 0 | 0 | 0 |
| Adkins fine sandy loam, wet | 3c | 3-15 | 1.4 | 0 | 1.4 | 1.4 | 0 | 0 | 1.4 ¹ | 1.4 ¹ | |
| Quincy fine sand | 74b | 0-5 | 0.8 | 0.8 | 0 | 0 | 0 | 0.8 | 0 | 0 | 0 |
| Quincy loamy fine sand | 75b | 0-5 | 7.1 | 7.1 | 0 | 0 | 7.1 | 0 | 0 | 0 | 0 |
| Quincy loamy fine sand | 75e | 5-25 | 0.4 | 0.4 | 0 | 0 | 0.4 | 0.4 | 0 | 0 | |
| Sagehill fine sandy loam | 87b | 2-5 | 2.3 | 2.3 | 0 | 2.3 | 0 | 0 | 0 | 0 | 2.3 |
| Starbuck-rock outcrop | 94a | 0-5 | 22.8 | 0 | 22.8 | 22.8 | 0 | 0 | 22.8 | 22.8 | 0 |
| Taunton fine sandy loam | 95b | 1-7 | 3.8 | 3.8 | 0 | 3.8 | 0 | 0 | 0 | 0 | 0 |
| Wanser loamy fine sand | 119a | 0-3 | 15.6 | 15.6 | 0 | 0 | 15.6 | 0 | 0 | 0 | 0 |
| Winchester sand | 122b | 0-5 | 28.3 | 28.3 | 0 | 0 | 0 | 28.3 | 0 | 0 | |
| Total Acreage | | | 120.2 | 96.0 | 24.2 | 68.0 | 22.7 | 29.5 | 24.2 | 24.2 | 31.5 |
| | | | | | | | | | | | |
| Electric Transmission Route | | | | | | | | | | | |
| Adkins fine sandy loam | 1b | 0-5 | 14.6 | 14.6 | 0 | 14.6 | 0 | 0 | 0 | 0 | 14.6 |
| Adkins fine sandy loam, wet | 3a | 0-3 | 22.9 | 22.9 | 0 | 22.9 | 0 | 0 | 0 | 0 | 0 |
| Burbank loamy fine sand | 14b | 0-5 | 1.3 | 1.3 | 0 | 0 | 1.3 | 0 | 1.3 | 1.3 | 0 |
| Quincy loamy fine sand | 75e | 5-25 | 3.4 | 3.4 | 0 | 0 | 3.4 | 0 | 0 | 0 | 0 |
| Starbuck very fine sandy loam | 93b | 2-20 | 11.1 | 0 | 11.1 | 11.1 | 0 | 0 | 11.1 | 11.1 | 0 |
| Starbuck-rock outcrop | 94.a | 0-5 | 26.2 | 0 | 26.2 | 26.2 | 0 | 0 | 26.2 | 26.2 | 0 |
| Water | -- | -- | 1.6 | -- | -- | -- | -- | -- | -- | -- | -- |
| Total Acreage | | | 81.1 | 42.2 | 37.3 | 74.8 | 4.7 | 0 | 38.6 | 38.6 | 14.6 |

¹Bedrock possible in some areas at depths of 40 to 60 inches.

Wind Soil Erosion

Surface disturbance due to construction activities can contribute to wind erosion effects on soils. Soil texture, soil moisture, topography, climatic conditions, vegetative cover, and the extent and duration of surface disturbance affect wind erosion rates. The periods of highest winds in this portion of Oregon usually occur in October to November and January to April. However, high winds can occur throughout the year within this region. As shown in **Table 3.2-2**, moderate to very high wind erosion hazards exist within all project components due to an abundance of sandy soils. The following project components have high or very high wind erosion ratings. The location of these areas is shown in **Figure 3.2-1**.

- Water Supply Line² – 6.4 acres of high wind erosion soils.
- Natural Gas Supply/**Plant Discharge** Water Pipeline Route – **23.1** acres of high wind erosion and 29.5 acres of very high wind erosion.
- Electric Transmission Line – 4.7 acres of high wind erosion.

Project-committed measures would be implemented to control or reduce wind soil erosion, involving revegetation and restoration of disturbed areas as required in the SWPPP. By implementing erosion control practices, wind erosion effects on soils would be reduced. However, surface disturbance along portions of the natural gas supply/**plant** discharge **water** pipeline Proposed Action route would still have potential to exhibit wind erosion until the ROW is reclaimed.

Recommended Mitigation Measures. The following measures would be implemented to reduce wind erosion effects on soils.

S-1: Restrict construction traffic to the defined ROW.

S-2: Restrict the pipeline construction ROW width to 75 feet in the Wanser loamy fine sand and Winchester sand units where the natural gas supply/**plant** discharge **water** pipeline route crosses native vegetation communities.

² *Water supply line ROW would be utilized for potable water and sanitary sewer pipeline.*

S-3: Use measures such as topsoil matting, planting of cover crops, or soil binder in the Wanser loamy fine sand and Winchester sand units along the southern portion of the natural gas supply/*plant* discharge *water* pipeline routes to reduce wind erosion.

Potential Reductions in Agricultural Productivity

Construction of the natural gas supply/*plant* discharge *water* pipelines would require grading, excavations, trenching, and backfilling. The mixing of topsoil with less productive subsoil horizons during these activities could affect soil productivity. Two areas along the Proposed Action natural gas supply/*plant* discharge *water* pipeline route contain prime farmland soil (29.2 acres of Adkins fine sandy loam and 2.3 acres of Sagehill fine sandy loam). Other soils in the project area are used for rangeland and irrigated crops, but they are not classified as prime farmland.

The addition of plant discharge water to Cold Springs Reservoir is not expected to increase TDS significantly during the irrigation season or have any potential impact on crops irrigated with reservoir water. Prior to and during the irrigation season, large volumes of Umatilla River water and Columbia River water are added to the reservoir. This large addition of low TDS water more than offsets the addition of TDS from plant discharge water.

Recommended Mitigation Measures. The following measures would be used to minimize effects of soil disturbance on agricultural productivity.

S-4: Segregate the stripped topsoil separately from the trench soil.

S-5: Remove all excess large-size rock from the upper 12 inches of the soil to the extent practical in agricultural and residential areas.

Rock Management

The presence of basalt outcrops in the construction areas would require engineering decisions on the method of removal (blasting, cutting, etc.) and where to place the rock after construction is completed. As shown in **Table 3.2-2**, shallow bedrock is present in all project components due to the Starbuck rock outcrop and Starbuck very fine sandy loam soil units.

Recommended Mitigation Measures: The following measure would be used to ensure that excess rock is not left on the soil surface where it would interfere with plant growth.

S-6: Excess pipeline trench rock would be placed in a landowner-approved location.

3.2.3 *Proposed Action Impact Summary*

The effects of project construction and facility siting and operation on geology would be minor. No geologic hazards such as subsidence, faults, or soil liquefaction occur within or near project component study areas. The prevalence of relatively gentle slopes in the project study area indicates that there is no landslide hazard.

Potential impacts of constructing the project components would include soil disturbance, increased water and wind erosion, reduced agricultural productivity, and management of rock present in excavation areas. Project construction would result in a temporary disturbance to soils, particularly associated with the gas supply/*plant* discharge *water* pipelines. By implementing the SWPPP and reclamation, water erosion would be minimized and returned to pre-construction conditions. The effects of soil erosion from wind would be reduced to pre-construction conditions by implementing mitigation to control dust, reduce traffic use and stabilize soil surfaces in highly erodible areas. Construction of the gas supply/*plant* discharge *water* pipelines would result in temporary disturbance to 32 acres of prime farmland. However, topsoil and rock management mitigation measures would ensure that effects would be short-term and minor. The presence of rock would require engineering decisions on removal and rock disposal, particularly for the plant site and gas supply/*plant* discharge *water* pipelines. The construction techniques and disposal methods would be designed to minimize effects on other environmental resources.

3.2.4 *Component Alternatives Impact Summaries*

*Comparisons of the relative soils impacts of No Action, Proposed Action, and constructing and operating project component alternatives in different locations are presented in Table 3.2-3 (gas/*plant* discharge *water* pipelines), Table 3.2-4 (transmission lines), and Table 3.2-5 (*plant* discharge locations).*

Table 3.2-3
Natural Gas Supply/Plant Discharge Water Pipeline Alternatives Comparison – Soils

| Resource/Impact Issue | Alternatives | | | | | | | |
|---|--------------------------------------|---|---|---|---|---|---|---|
| | No Action | Proposed Action | 1 | 2 | 3 | 4 | 5 | 6 |
| | | (Figure 2.3-1) | (Figure 2.4-1) | (Figure 2.4-2) | (Figure 2.4-3) | (Figure 2.4-4) | (Figure 2.4-5) | (Figure 2.4-6) |
| Soils | | | | | | | | |
| Presence of large rock in trenched area | No new soil disturbance would occur. | Approximately 24 acres contain outcrop or large rock in the upper 40 inches of soil. | Approximately 27 acres contain outcrop or large rock in the upper 40 inches of soil. | Approximately 25 acres contain outcrop or large rock in the upper 40 inches of soil. | Approximately 25 acres contain outcrop or large rock in the upper 40 inches of soil. | Approximately 25 acres contain outcrop or large rock in the upper 40 inches of soil. | Approximately 24 acres contain outcrop or large rock in the upper 40 inches of soil. | Approximately 24 acres contain outcrop or large rock in the upper 40 inches of soil. |
| Prime farmland | No new soil disturbance would occur | Approximately 37 acres temporarily affected within the ROW. | Approximately 39 acres temporarily affected within the ROW. | Approximately 45 acres temporarily affected within the ROW. | Approximately 39 acres temporarily affected within the ROW. | Approximately 37 acres temporarily affected within the ROW. | Approximately 35 acres temporarily affected within the ROW. | Approximately 34 acres temporarily affected within the ROW. |
| Moderate water erosion | No new soil disturbance would occur | Approximately 32 acres in the construction ROW have moderate water erosion potential. | Approximately 43 acres in the construction ROW have moderate water erosion potential. | Approximately 44 acres in the construction ROW have moderate water erosion potential. | Approximately 37 acres in the construction ROW have moderate water erosion potential. | Approximately 33 acres in the construction ROW have moderate water erosion potential. | Approximately 33 acres in the construction ROW have moderate water erosion potential. | Approximately 32 acres in the construction ROW have moderate water erosion potential. |
| Moderate wind erosion | No new soil disturbance would occur | Approximately 66 acres in the construction ROW have moderate wind erosion potential | Approximately 73 acres in the construction ROW have moderate wind erosion potential. | Approximately 73 acres in the construction ROW have moderate wind erosion potential. | Approximately 61 acres in the construction ROW have moderate wind erosion potential. | Approximately 61 acres in the construction ROW have moderate wind erosion potential | Approximately 39 acres in the construction ROW have moderate wind erosion potential | Approximately 40 acres in the construction ROW have moderate wind erosion potential |
| High wind erosion | No new soil disturbance would occur | Approximately 23 acres in the construction ROW have high wind erosion potential. | Approximately 24 acres in the construction ROW have high wind erosion potential. | Approximately 8 acres in the construction ROW have high wind erosion potential. | Approximately 32 acres in the construction ROW have high wind erosion potential. | Approximately 21 acres in the construction ROW have high wind erosion potential. | Approximately 4 acres in the construction ROW have high wind erosion potential. | Approximately 6 acres in the construction ROW have high wind erosion potential |
| Very high wind erosion | No new soil disturbance would occur | Approximately 29 acres in the construction ROW have very high wind erosion potential. | Approximately 26 acres in the construction ROW have very high wind erosion potential. | Approximately 42 acres in the construction ROW have very high wind erosion potential. | Approximately 18 acres in the construction ROW have very high wind erosion potential. | Approximately 23 acres in the construction ROW have very high wind erosion potential. | No soils crossed with very high wind erosion potential. | No soils crossed with very high wind erosion potential. |

Table 3.2-4
Electric Transmission Line Alternatives Comparison – Soils

| | Alternatives | | | | |
|----------------|-------------------------------------|------------------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| | No Action | Proposed Action | 1 | 2 | 3 |
| | | (Figure 2.3-1) | (Figure 2.4-7) | (Figure 2.4-8) | (Figure 2.4-10) |
| Soils | | | | | |
| Prime farmland | No new soil disturbance would occur | Approximately 15 acres in the ROW. | Approximately 15 acres in the ROW. | Approximately 4 acres in the ROW. | Approximately 4 acres in the ROW. |

Table 3.2-5
Plant Discharge Location Alternatives Comparison – Soils

| | Alternatives | | |
|----------------------|--|---|---|
| | No Action | Proposed Action | 1 |
| | | (Figure 2.3-1) | (Figure 2.4-11) |
| Soils | | | |
| Bedrock Construction | No new bedrock construction would occur. | Approximately 1.7 miles of pipeline construction ROW containing bedrock or large rock would have to be cleared and excavated which represent difficult revegetation conditions. | Approximately 0.3 miles of pipeline construction ROW containing bedrock or large rock would have to be cleared and excavated which represent difficult revegetation conditions. |
| Soils | No new soil disturbance would occur. | Approximately 2 acres of native vegetation soils, and 5 acres of cropland soils would be temporarily disturbed during construction, resulting in a local increase in soil and water erosion from unprotected surfaces. The remainder of the surface disturbance for the plant discharge water pipeline is included in the ROW for the gas supply pipeline, which is the same for both alternatives. | Approximately 5 acres of native vegetation soils would be temporarily disturbed during construction, resulting in a local increase in soil and water erosion from unprotected surfaces. |

3.3 Water Resources (Surface Water and Groundwater Quantity and Quality)

3.3.1 *Affected Environment*

3.3.1.1 Surface Water

Regional Hydrology

The proposed generating plant site lies directly adjacent to the south bank of the Columbia River, the region's dominant surface water feature. The project site is located on a bluff overlooking the Columbia River approximately 2 miles east of McNary Dam, which is operated by the USACE for hydroelectric power. The Umatilla River is located approximately 4 miles west of the plant site and flows into the Columbia River at the City of Umatilla. The plant site is located within a small closed subbasin that includes the Wanaket Wildlife Management Area immediately south and east. The subbasin is adjacent to the Columbia-Umatilla plateau hydrologic subbasin of the Umatilla River, which is to the south and west. **Figure 3.3-1** illustrates the surface hydrologic system that includes the Columbia and Umatilla rivers.

The Columbia River discharges an average of approximately 191,000 cfs at McNary Dam which is located 2 miles to the west of the proposed plant site. Flow in the Columbia River and discharge at the dam vary seasonally and year-to-year. High flows usually occur from April to June and range from 350,000 cfs to 600,000 cfs. Low flows occur from August to November and range from 65,000 cfs to 85,000 cfs.

Cold Springs Reservoir is located approximately six miles southeast of the proposed plant site and six miles northeast of Hermiston, Oregon, off State Road 207. This reservoir is operated by the Hermiston Irrigation District (HID) and is part of the Reclamation's Umatilla Reclamation Project. The original Umatilla Reclamation Project was initiated by the Reclamation in 1905 to supply full or supplemental irrigation water to approximately 34,000 acres of agricultural land in north central Oregon. The East Division of the Umatilla Reclamation Project is the HID and consists of Cold Springs Dam and Reservoir (constructed in 1908), Feed Canal Diversion Dam and Canal and Maxwell Diversion Dam and Canal. The Feed Canal Diversion Dam is located on the Umatilla River, approximately 1.5 miles southeast of Echo, Oregon. The dam raises the water level in the riverbed to provide diversion into the 25-mile-long Feed Canal (maximum operational capability of 220 cfs per second). The Feed Canal conveys river water to the Cold Springs Reservoir.

Diversion continues throughout the winter and spring months until June when diversion and flow in the canal are ended. Water is released from the reservoir for irrigation use throughout the summer and early autumn months. The reservoir has a total active capacity of 44,600 acre-feet, a normal storage capacity of 38,000 acre-feet for irrigation, 1,530 acres of water surface, and 12 miles of shoreline. During the summer and fall months, water is discharged for irrigation use and flows through canals to agricultural areas. Irrigation drain water is collected in drain canals and ultimately returns to the Umatilla River near Hermiston.

Activities were initiated in the mid-1980s under the Umatilla Basin Project to restore instream flows in the Umatilla River for anadromous fish but maintain irrigation water for continued use. These activities included channel modifications, construction of fish ladders, fish traps and fish screens and construction of water exchange facilities to deliver irrigation replacement water from the Columbia River. The Columbia River Pumping Plant was built on the Columbia River just downstream of the Sand Station Recreation Area and the Columbia-Cold Springs Canal was constructed to convey water from Lake Wallula, which is created by McNary Dam, to Cold Springs Reservoir.

Local Hydrology

The proposed power plant site is currently undeveloped and has no defined natural drainage channels or subbasin outlets. The site is located on a bluff overlooking the Columbia River with an approximate height of 160 feet above normal river level. The area is considered semi-arid, receiving 8 to 10 inches of rainfall annually with most precipitation occurring between October and April. The site is relatively flat with thin but permeable soils – normal precipitation would percolate into the ground or evaporate. Excessive volumes of run-off would probably enter the Wanaket Wildlife Management Area and accumulate in wetland ponds.

Surface Water Quality

Oregon DEQ's 2002 303(d) list identifies Oregon waterbodies that are impaired and not meeting state water quality standards. The section of the Columbia River above McNary Dam is on the 2002 303(d) list for exceeding temperature standards in the summer – it is not listed for any other parameter. Cold Springs Reservoir does not appear on the Oregon DEQ's 2002 303(d) list. Several sections of the Umatilla River appear on the 2002 303(d) list. The impairment parameters listed are dissolved oxygen, iron, and manganese.

Samples from the Columbia River were collected at the Port of Umatilla's intake in January and February 2002 and June 2003 and analyzed for critical parameters. **Table 3.3-1** presents this data and applicable Oregon water quality standards. Samples of Cold Springs Reservoir were collected in August 2003 *and May 2004 and* analyzed. Data associated with water quality standards are presented in **Table 3.3-2**. It is assumed that water in Cold Springs Reservoir is a combination of Columbia River water, Umatilla River water, and surface run-off.

Surface Water Management

Flows in all major rivers, reservoirs and other drainages are extensively managed. Most surface water in the Umatilla Basin is appropriated for agricultural use. The Columbia River is utilized for a variety of beneficial uses including hydropower, irrigation, recreation, water supply, navigation and fish and wildlife use. Oregon and Washington have a moratorium currently in place on granting new water rights, except under certain conditions.

The Port of Umatilla diverts water from the Columbia River into the regional water supply system under an existing municipal water use permit from the State of Oregon (Permit No. 49497, 1979). This permit is currently under an extension application, which would extend the permit date. The Port of Umatilla's raw water system serves the City of Hermiston and industrial users in northwestern Umatilla County. Committed uses (prior to this proposed project) represent a total of 23.4 cfs from a total water right of 155 cfs. The Port's intake system is located at the Port of Umatilla Dock (RM 293 in the Columbia River), upstream of the boat launch ramp above McNary Dam. The intake was built in 1995 and consists of four intake bays, three of which currently house pumps and discharge piping. Intake bays are screened (0.125 mesh) and are designed for 0.4 cfs approach velocities. Actual withdrawal rates vary, depending on seasonal and operational water demand.

3.3.1.2 Groundwater

The proposed project area is underlain by Columbia River basalt with a confined "deep" aquifer. Groundwater flow is indicated to be generally from south to north, toward the Columbia River. Other areas of central Oregon, to the west and south, have been designated "critical groundwater areas" due to extensive withdrawals and subsequent impacts to groundwater availability and quality. Many aquifers have been extensively used for irrigation which, due to slow recharge, has

Table 3.3-1
Water Quality Sampling Results for the Columbia River
(Winter and Spring) and Comparisons with Water Quality Standards

| Analytes | Units | Average of Detected Analytes Winter 2001-2002 | Average of Detected Analytes Spring 2003 | Average of Detected Analytes Winter and Spring | Lowest Applicable Aquatic Life Water Quality Standard |
|----------------------------------|--------------|--|---|---|--|
| Total Recoverable Aluminum - Al | ug/L | 131 | 300 | 215 | |
| Dissolved Aluminum - Al | ug/L | NA | 9.3 | 9.3 | |
| Total Recoverable Antimony - Sb | ug/L | 0.144 | 0.143 | 0.143 | |
| Dissolved Antimony - Sb | ug/L | NA | 0.136 | 0.136 | 1,600 ¹ |
| Total Recoverable Arsenic - As | ug/L | 1.09 | 0.95 | 1.02 | |
| Dissolved Arsenic - As | ug/L | NA | 0.78 | 0.78 | |
| Total Recoverable Barium - Ba | ug/L | 27.3 | 20.0 | 23.7 | |
| Dissolved Barium - Ba | ug/L | NA | 17.5 | 17.5 | |
| Total Recoverable Beryllium - Be | ug/L | 0.007 | 0.023 | 0.015 | |
| Dissolved Beryllium - Be | ug/L | NA | <0.020 | <0.020 | 5.3 ¹ |
| Total Recoverable Boron - B | ug/L | 13.60 | 6.18 | 9.89 | |
| Dissolved Boron - B | ug/L | NA | 5.9 | 5.9 | |
| Total Recoverable Cadmium - Cd | ug/L | 0.014 | 0.019 | 0.017 | |
| Dissolved Cadmium - Cd | ug/L | NA | 0.008 | 0.008 | 1.1 ¹ |
| Total Recoverable Chromium - Cr | ug/L | 0.26 | 0.19 | 0.23 | |
| Dissolved Chromium - Cr | ug/L | NA | <0.07 | <0.07 | |
| Total Recoverable Cobalt - Co | ug/L | 0.10 | 0.17 | 0.14 | |
| Dissolved Cobalt - Co | ug/L | NA | <0.05 | <0.05 | |
| Total Recoverable Copper - Cu | ug/L | 1.28 | 1.60 | 1.44 | |
| Dissolved Copper - Cu | ug/L | NA | 1.04 | 1.04 | 12 ¹ |
| Total Recoverable Iron - Fe | ug/L | 162 | 276 | 219 | |
| Dissolved Iron - Fe | ug/L | NA | 8.1 | 8.1 | 1,000 ¹ |

Table 3.3-1 (Continued)

| Analytes | Units | Average of Detected Analytes Winter 2001-2002 | Average of Detected Analytes Spring 2003 | Average of Detected Analytes Winter and Spring | Lowest Applicable Aquatic Life Water Quality Standard |
|-----------------------------------|--------------|--|---|---|--|
| Total Recoverable Lead - Pb | ug/L | 0.174 | 0.663 | 0.419 | |
| Dissolved Lead - Pb | ug/L | NA | 0.141 | 0.141 | 3.2 ¹ |
| Total Recoverable Lithium - Li | ug/L | 3.92 | 2.08 | 3.00 | |
| Dissolved Lithium - Li | ug/L | NA | 1.79 | 1.79 | |
| Total Recoverable Manganese - Mn | ug/L | 7.34 | 15.73 | 11.54 | |
| Dissolved Manganese - Mn | ug/L | NA | 0.93 | 0.93 | |
| Total Recoverable Mercury - Hg | ug/L | 0.0023 | 0.0019 | 0.0021 | |
| Dissolved Mercury - Hg | ug/L | NA | 0.00056 | 0.00056 | 0.012 ¹ |
| Total Recoverable Molybdenum - Mo | ug/L | 0.97 | 0.63 | 0.80 | |
| Dissolved Molybdenum - Mo | ug/L | NA | 0.64 | 0.64 | |
| Total Recoverable Nickel - Ni | ug/L | 0.22 | 0.11 | 0.16 | |
| Dissolved Nickel - Ni | ug/L | NA | <0.04 | <0.04 | 160 ¹ |
| Total Recoverable Selenium - Se | ug/L | 0.146 | <0.30 | 0.146 | |
| Dissolved Selenium - Se | ug/L | NA | <0.30 | <0.30 | 5 ¹ |
| Total Recoverable Silver - Ag | ug/L | 0.002 | <0.015 | 0.002 | |
| Dissolved Silver - Ag | ug/L | NA | <0.015 | <0.015 | 0.12 ¹ |
| Total Recoverable Strontium - Sr | ug/L | 107 | 65.0 | 86.0 | |
| Dissolved Strontium - Sr | ug/L | NA | 65.7 | 65.7 | |
| Total Recoverable Thallium - Th | ug/L | 0.026 | <0.020 | 0.026 | |
| Dissolved Thallium - Th | ug/L | NA | <0.020 | <0.020 | 40 ¹ |
| Total Recoverable Tin - Sn | ug/L | 0.03 | <0.10 | 0.03 | |
| Dissolved Tin - Sn | ug/L | NA | <0.10 | <0.10 | |
| Total Recoverable Titanium - Ti | ug/L | 7.08 | 19.8 | 13.46 | |
| Dissolved Titanium - Ti | ug/L | NA | 12.0 | 12.0 | |

Table 3.3-1 (Continued)

| Analytes | Units | Average of Detected Analytes Winter 2001-2002 | Average of Detected Analytes Spring 2003 | Average of Detected Analytes Winter and Spring | Lowest Applicable Aquatic Life Water Quality Standard |
|---|--------------|--|---|---|--|
| Total Recoverable Tungsten - W | ug/L | 0.07 | 0.04 | 0.06 | |
| Dissolved Tungsten - W | ug/L | NA | 0.039 | 0.039 | |
| Total Recoverable Vanadium - V | ug/L | 1.77 | 1.60 | 1.69 | |
| Dissolved Vanadium - V | ug/L | NA | 1.10 | 1.10 | |
| Total Recoverable Zinc - Zn | ug/L | 1.77 | 3.65 | 2.71 | |
| Dissolved Zinc - Zn | ug/L | NA | 1.21 | 1.21 | 110 ¹ |
| Alkalinity as CaCO ₃ , Total | mg/L | 75 | 45 | 60 | 20 ² |
| Ammonia as Nitrogen | mg/L | 0.05 | 0.07 | 0.06 | |
| Bicarbonate as CaCO ₃ | mg/L | 75 | 45 | 60 | |
| Biochemical Oxygen Demand (BOD) | mg/L | <4 | <4 | <4 | |
| Calcium | mg/L | 22.4 | 13 | 17.7 | |
| Carbonate as CaCO ₃ | mg/L | <2 | <2 | <2 | |
| Chemical Oxygen Demand (COD) | mg/L | <5 | 9 | 9 | |
| Chloride | mg/L | 3.8 | 1.6 | 2.7 | 230 ¹ |
| Conductivity | umhos/cm | 194 | 103 | 149 | |
| Fecal Coliform | MPN/100 ml | 9 | 6 | 8 | |
| Fluoride | mg/L | <0.2 | <0.2 | <0.2 | |
| Magnesium | mg/L | 6.63 | 4 | 5.07 | |
| Nitrate as Nitrogen | mg/L | 0.4 | <0.1 | 0 | |
| Nitrite as Nitrogen | mg/L | <0.1 | <0.1 | <0.1 | |
| Nitrogen, Total Kjeldahl (TKN) | mg/L | 0.2 | 0.1 | 0.2 | |
| Nitrogen, Total Organic | mg/L | 0.15 | 0.1 | 0.13 | |
| Oil and Grease | mg/L | <5.0 | <5.0 | <5.0 | |
| Orthophosphate as Phosphorus | mg/L | 0.03 | 0.01 | 0.02 | |

Table 3.3-1 (Continued)

| Analytes | Units | Average of Detected Analytes Winter 2001-2002 | Average of Detected Analytes Spring 2003 | Average of Detected Analytes Winter and Spring | Lowest Applicable Aquatic Life Water Quality Standard |
|--|----------|---|---|--|--|
| Orthophosphate as Phosphorus, Filtered | mg/L | 0.02 | 0.01 | 0.01 | |
| pH | pH units | 7.95 | 7.8 | 7.86 | 7 - 8.5 ³ |
| Phenolics, Total | mg/L | <0.01 | <0.01 | <0.1 | 2.56 ¹ |
| Phosphorus, Total | mg/L | 0.03 | 0.04 | 0.04 | |
| Phosphorus, Total Dissolved | mg/L | 0.04 | 0.02 | 0.03 | |
| Potassium | mg/L | <2.0 | <2.0 | <2.0 | |
| Silica, Reactive Dissolved | mg/L | 3.95 | 8.9 | 6.42 | |
| Silicon, Filtered | mg/L | 11.8 | 7.72 | 9.7 | |
| Silicon, Total | mg/L | 6.26 | 15.74 | 11.00 | |
| Sodium | mg/L | 8.51 | 4.14 | 6.33 | |
| Sulfate | mg/L | 15.8 | 7.6 | 11.7 | |
| Total Dissolved Solids (TDS) | mg/L | 101 | 72 | 87 | |
| Total Organic Carbon | mg/L | 1.1 | 2.3 | 1.7 | |
| Total Suspended Solids (TSS) | mg/L | 9 | 8.5 | 8.8 | |
| Turbidity | NTU | 2.3 | 6.4 | 4.4 | |

¹Protection of Aquatic Life - Fresh Chronic Criteria.

²Standard is for minimum alkalinity.

³ORS 468 - Umatilla Basin - 340-041-0645 2 (d) (A).

NA = data not available/analysis not conducted.

Table 3.3-2
Comparison of Cold Springs Reservoir Water Quality with Estimated Effluent Quality

| Analyte | Units | Reservoir (average) | Estimated Effluent | Lowest Applicable Aquatic Life Water Quality Standard |
|--------------------------|--------------|--------------------------------|---------------------------|--|
| Dissolved Antimony – Sb | µg/l | 0.075 | 0.700 | 1,600 |
| Dissolved Beryllium – Be | µg/l | 0.023 | 0.042 | 5.3 |
| Dissolved Cadmium – Cd | µg/l | 0.009 | 0.074 | 1.1 |
| Dissolved Copper – Cu | µg/l | 0.91 | 5.80 | 12 |
| Dissolved Iron – Fe | µg/l | 24.6 | 685 | 1,000 |
| Dissolved Lead – Pb | µg/l | 0.019 | 0.800 | 3.2 |
| Dissolved Mercury – Hg | µg/l | 0.00082 | 0.00160 | 0.012 |
| Dissolved Nickel - Ni | µg/l | 0.07 | 1.50 | 160 |
| Dissolved Selenium – Se | µg/l | 0.41 | 0.70 | 5 |
| Dissolved Silver – Ag | µg/l | 0.016 | 0.011 | 0.12 |
| Dissolved Thallium - Th | µg/l | 0.088 | 0.074 | 40 |
| Dissolved Zinc - Zn | µg/l | 0.26 | 8.9 | 110 |
| Alkalinity | mg/l | 67 | 188 | 20 ¹ |
| Chloride | mg/l | 8.3 | 20.0 | 230 |
| pH | S.U. | 8.45 | 7.5-8.5 | 7 – 8.5 |
| Phenolics | mg/l | 0.02 | 0.053 | 2.56 |
| Total Dissolved Solids | mg/l | 117 | 1,586 | N/A |

¹Minimum concentration.

resulted in rapidly dropping water levels for the last forty years. The project site is not located in one of the state's critical groundwater areas. Groundwater may be initially encountered at 75 to 100 feet below ground surface.

3.3.2 *Environmental Consequences and Mitigation*

3.3.2.1 Surface Water

Water Diversion from the Columbia River

Water for the proposed project would be supplied by the Port of Umatilla's regional water supply system. Under an existing water right, the Port of Umatilla pumps water from the Columbia River to various municipal, industrial and agricultural users. A pump would be added to the existing intake structure and a pipeline would be constructed to *transport* water to the proposed project.

As shown in Table 2.3-3, maximum water demand at the proposed project would be 17.7 cfs.¹ Average annualized daily water demand would be 12.4 cfs.

Flow in the Columbia River is usually in the range of 65,000 to 85,000 cfs during the low flow period in the fall. The *annual average volume of* water diverted for this project would represent approximately 0.02 percent of river flow during low flow periods. The percentage diverted would be considerably lower in high flow periods. Because the Columbia River is extensively dammed, peak flows are reduced and low flows are increased which means river flow does not fluctuate as much. The lowest flow recorded in recent years was 48,000 cfs in 1977. Even if this extremely low flow period occurred again, the maximum rate of water diverted for this project would represent 0.04 percent of overall river flow.

Several species of fish in the Columbia River are listed under the ESA. Fish populations are at less than one-third of historic numbers. The Tribes' treaty reserved right to fish is negatively impacted, eroding the Tribes' culture, impacting the health of Tribal members, and violating their treaty rights. The proposed project is designed to avoid an overall negative impact on fish that results from adding to new cumulative depletions of Columbia River in-stream flows. The project achieves this goal by using only existing water rights.

¹ *This maximum flow would occur only when ambient temperature reaches 107°F.*

The small change in river flow due to the proposed project would not reduce beneficial uses of the river or water quality. Beneficial uses include hydropower generation, navigation, municipal and industrial supply, agricultural use and protection of fish and wildlife. There would be no effect on downstream water users and no measurable reduction in water levels. River water quality also would not be affected by this amount of withdrawal.

The proposed power plant would be designed with a number of components and systems incorporating water re-use and reduced water consumption. The plant would incorporate a recirculating cooling system that includes cooling towers with high-efficiency drift eliminators. The cooling system would be operated at the highest level of cycles possible without jeopardizing system components (*and within the limits for PM₁₀ established by USEPA in the air quality permit*), which reduces the volume of raw water required as makeup. All wastewater streams generated within the facility would be routed to the cooling system as makeup to reduce the volume of raw water required.

Recommended Mitigation Measures: No measures beyond those included in the proposed project are recommended.

Wastewater Generation

The proposed facility would generate wastewater that is primarily comprised of cooling tower blowdown. The plant also would generate small quantities of process wastewater, sanitary sewage and storm water. Process wastewater would include boiler blowdown, filter backwash, residual streams from water treatment processes and washwater. Process wastewater would be piped to the cooling system as makeup, which *would* reduce the quantity of raw water required. *The only significant potential contamination that may be present in the small volumes of process wastewater is oil and grease – process wastewater would be treated for oil and grease prior to being added to the cooling system as make-up. Wastewater produced during periodic cleaning of the HRSGs would be collected and disposed of by a licensed contractor.*

Cooling system blowdown consists primarily of raw water that has been subjected to a heat load and undergone evaporation of most of the water to the atmosphere. When the water is evaporated off, the dissolved solids that were present are left behind. Thus, the concentration of dissolved ions increases proportionately with the number of "cycles" at which the system operates. The higher the

number of cycles means the lower the volume of blowdown and the lower the rate of makeup addition that is required. If a system is operated at six cycles, then the concentration of dissolved solids in the blowdown will be multiplied approximately six times that of the raw water concentration. The efficiency of the cooling system and its associated cost of operation are determined by the number of cycles.

Columbia River water is considered good quality makeup – typically, total dissolved solids concentrations are approximately 100 milligrams per liter (mg/l). The cooling system would be designed to operate at six cycles – as a result, *each* dissolved ion concentration in the blowdown would be approximately six times the concentration in the raw water. Temperatures of the *plant discharge water* would be controlled within the range of 70 to 75°F, *based on 93°F ambient dry bulb temperature*.

Very small quantities of water treatment chemicals would be added to the cooling system for corrosion protection, deposit control, pH control and prevention of microbiological growth. These chemicals *would* include sulfuric acid, sodium hypochlorite (bleach solution), and mixtures of inorganic phosphates, organic phosphates and polymers. All of these chemicals are regarded as non-toxic in the quantities to be used. Feed rates are usually in the range of 1 to 20 parts per million (ppm) and concentrations in the final blowdown are considerably lower due to chemical reactions, evaporation, and absorption onto suspended solids and system surfaces.

Plant Discharge to Cold Springs Reservoir

As shown in Table 2.3-4, plant discharge rates for two blocks would average 1.6 million gallons per day (MGD) or 2.4 cfs with a maximum flow rate of 2.2 MGD or 3.4 cfs. Plant discharge water would be pumped at a rate of approximately 2.3 cfs from the plant's retention pond to Cold Springs Reservoir via a 9-mile pipeline – it would discharge into the drop structure at the end of the Feed Canal immediately upstream of the reservoir or into a diffuser that would extend out into the main “dead pool” area of the reservoir. During the months of November through June, water from the Umatilla River also would be flowing in the canal and would mix with plant *discharge water*. The maximum flow rate of 3.4 cfs would represent 1.7 percent of the maximum flow capacity of the Feed Canal. During the remainder of the year, plant *discharge water* would be the only flow in the canal. During the summer months, water level in the reservoir is drawn down for agricultural use – as the water level approaches very low volume, water quality in the reservoir decreases due to wind effect on shallow areas, sediment interaction, biological growth and higher

turbidity. Even at the reservoir's lowest or "dead pool" level of approximately **1,000** acre-feet, the average inflow of plant discharge water would represent an incremental addition of **0.5** percent of the total reservoir volume on a daily basis. Under normal operating circumstances, the volume of plant discharge **water** would have minimal effect on reservoir water quality and would supplement the volume of stored water for irrigation use.

The Cold Springs Reservoir was sampled in August 2003 *and May 2004* to collect information on existing water quality in the reservoir and enable an initial evaluation of the potential impact of the plant's discharge. At the time of *the August* sampling, the level of the reservoir had been drawn down very low due to summer withdrawals for irrigation. Columbia River water was being added to the reservoir at the time of sampling to supplement available water. It is expected that water quality in the reservoir would be poorest during the late summer and early autumn months when the level is at its lowest. Six locations were sampled on the reservoir *in August 2003 and an additional two locations were sampled in May 2004*. The results of these samples were averaged and compared with the estimated **plant discharge water** quality. Of particular interest were the parameters that have water quality standards associated with aquatic life beneficial use (see **Table 3.3-2**).

In evaluating metals concentrations, it was found that in most locations, most metals concentrations were slightly to somewhat higher in the **plant discharge water** than in the reservoir. For several metals such as iron, mercury and silver, concentrations in the **plant discharge water** are estimated to be lower than existing concentrations in the reservoir. No metals concentrations in either the reservoir or the **plant discharge water** approach any applicable water quality standard. Recoverable metals concentrations were compared to the water quality standards which are expressed as dissolved metals concentrations; this represents a more conservative and protective analysis since dissolved concentrations are almost always less than recoverable concentrations. Because the reservoir appears to exceed the water quality standard for pH at *certain* times of *the* year, the addition of the **plant discharge water** should help reduce the pH and bring the reservoir pH closer to the standard.

Organic compounds were not specifically analyzed. However, total phenolic compounds were analyzed at all locations at the reservoir and were estimated for the plant **discharge water**. Total phenolic compounds can often be an indicator of the presence of other significant organic compounds. The average concentration of phenolics in the reservoir *was* **0.02** microgram per liter ($\mu\text{g/l}$); the estimated concentration in the plant **discharge water** is **0.053** $\mu\text{g/l}$. The applicable water

quality standard (chronic criterion) is 2.56 µg/l. The concentrations in the reservoir and ***plant discharge water*** represent very low levels of organic compounds. The plant operation ***would*** not add any organic compounds.

Because participants in the Wanapa Energy Center have requested to deliver water to the Cold Springs Reservoir, a federal irrigation project administered by the Reclamation, the Reclamation must decide whether to accept this water in conjunction with existing uses and rights pertaining to this reservoir. The USFWS administers the Cold Springs Reservoir National Wildlife Refuge, which includes the reservoir surface area and adjacent lands. The ongoing management for waterfowl, fisheries, and threatened and endangered species will be considered in the Reclamation decision.

The discharge to the reservoir would be permitted under the NPDES program, administered by ***Oregon DEQ***. An application would be developed and submitted to ***Oregon DEQ*** with a copy to the ***USEPA Region 10***. ***Oregon DEQ*** would have primary authority for review and approval of the permit since the ***discharge location*** is ***not*** on tribal trust land. The application would include detailed information on plant processes and water treatment, estimated ***plant discharge water*** quality and the water quality status of Cold Springs Reservoir. It would be demonstrated that the addition of the ***plant discharge water*** to the reservoir would not significantly impact water quality in the reservoir. Preliminary evaluation of estimated water quality data indicates that water quality standards can be maintained. **Table 3.3-3** shows estimated concentrations of various parameters in the plant ***discharge water*** after 6 cycles of concentration based on analysis of raw water. No parameters exceed ***any*** state water quality standard ***including standards for aquatic and wildlife uses***. ***Oregon DEQ has not yet determined what standard or limit would apply for TDS and temperature. The TDS concentration of the plant discharge water exceeds the TDS concentrations of the water in Cold Springs Reservoir.*** However, if it is determined that ***plant discharge water*** quality can significantly impact water quality in the reservoir in some other way, the plant ***discharge water*** would be treated adequately before discharge to maintain water quality standards in the reservoir.

The NPDES permit, issued by ***Oregon DEQ***, would include specific requirements for monitoring the plant ***discharge water*** and mass/concentration limits for particular parameters. These limits would be imposed for any parameter that might prevent the attainment of a water quality standard applicable to the reservoir. Results of monitoring would be reported to the Oregon DEQ on a

Table 3.3-3
Estimated Quality of the Plant Discharge Water for Six Cycles of Concentration

| | Average of Raw Water Sampling Results (Samples Collected 12/21/01, 1/9/02, 1/17/02 from Columbia River) | Average Concentration¹ | Maximum Concentration¹ |
|---|--|--|--|
| Discharge Temp. °F² | | 70 | 96 |
| Plant Makeup, MGD | | 8.02 | 11.5 |
| Plant Discharge, MGD | | 1.6 | 2.2 |
| Plant Discharge, gpm | | 1,088 | 1,507 |
| <i>(total recoverable metals in ug/L)</i> | | | |
| Aluminum | 131 | 200.3 | 207.2 |
| Antimony | 0.144 | 0.7 | 0.8 |
| Arsenic | 1.090 | 6.9 | 7.1 |
| Barium | 27.3 | 139.2 | 143.9 |
| Beryllium | 0.007 | 0.042 | 0.044 |
| Boron | 13.6 | 75.4 | 78.0 |
| Cadimium | 0.014 | 0.074 | 0.076 |
| Chromium | 0.26 | 2.1 | 2.1 |
| Cobalt | 0.1 | 0.6 | 0.6 |
| Copper | 1.28 | 5.8 | 6.0 |
| Iron | 162 | 685.3 | 708.7 |
| Lead | 0.174 | 0.8 | 0.8 |
| Lithium | 3.92 | 18.1 | 18.7 |
| Manganese | 7.34 | 41.1 | 42.5 |
| Mercury | 2.3 | 1.6 | 1.6 |
| Molybdenum | 0.97 | 5.2 | 5.3 |
| Nickel | 0.22 | 1.5 | 1.6 |
| Selenium | 0.146 | 0.7 | 0.73 |
| Silver | 0.002 | 0.011 | 0.011 |
| Strontium | 107 | 564.1 | 583.3 |
| Thallium | 0.026 | 0.074 | 0.076 |
| Tin | 0.030 | 0.053 | 0.055 |
| Titanium | 7.080 | 41.2 | 42.6 |
| Tungsten | 0.070 | 0.4 | 0.4 |
| Vanadium | 1.770 | 10.9 | 11.2 |
| Zinc | 1.770 | 8.9 | 9.2 |

Table 3.3-3 (Continued)

| | Average of Raw Water Sampling Results (Samples Collected 12/21/01, 1/9/02, 1/17/02 from Columbia River) | Average Concentration¹ | Maximum Concentration¹ |
|--|--|--|--|
| Discharge Temp. °F² | | 70 | 96 |
| Plant Makeup, MGD | | 8.02 | 11.5 |
| Plant Discharge, MGD | | 1.6 | 2.2 |
| Plant Discharge, gpm | | 1,088 | 1,507 |
| <i>(Units = mg/L unless otherwise noted)</i> | | | |
| M. Alkalinity as CaCO₃ | 75 | 188 | 191 |
| Ammonia as N | 0.05 | 0.024 | 0.02 |
| Bicarbonate as CaCO₃ | 75 | 415 | 428 |
| Calcium | 22.4 | 119 | 123 |
| Chemical Oxygen Demand | <5 | - | - |
| Chloride | 3.8 | 20 | 21 |
| Spec Conductivity (mS/cm) | 194 | - | - |
| Fluoride | <0.2 | 1.1 | 1.1 |
| Magnesium | 6.63 | 35 | 36 |
| Nitrate as N | 0.4 | 2.0 | 2.0 |
| Oil and Grease | <5.0 | <1 | <1 |
| ortho Phosphate as P | 0.03 | 0.007 | 0.006 |
| Filtered Phosphate as P | 0.02 | - | - |
| pH (pH units) | 7.95 | 7.5 - 8.5 | 7.5 - 8.5 |
| Phenolics | <0.01 | 0.053 | 0.05 |
| Filtered Phosphorus as P | 0.03 | - | - |
| Total Phosphorus as P | 0.04 | 0.21 | 0.22 |
| Potassium | <2.0 | 11 | 11 |
| Silicate, reactive, dissolved | 11.8 | 63 | 65 |
| Sodium | 8.51 | 78 | 72 |
| Sulfate | 15.8 | 425 | 401 |
| Total Dissolved Solids | 101 | 1,586 | 1,589 |
| Total Organic Carbon | 1.1 | - | - |
| Total Suspended Solids | 9 | 43 | 44 |
| Turbidity (NTU) | 2.3 | - | - |

¹Plant water has adjusted quality for Al, Fe, and Hg. FeCl₃ and NaOH fed to clarifier. All filter backwash is recycled.

²The Discharge temperature is based on the cooling tower blowdown temperature.

monthly basis. Since the plant **discharge water** would be strictly monitored for potential impacts under the NPDES permit, no significant adverse effect on surface water quality would occur.

Appendix B presents additional discussion and detail on water use and discharge.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Construction Storm Water Management

Construction of the power plant, pipelines, and transmission lines would require disturbance of soils and could result in transport of sediment during rain events. This potential transport of sediment and water could enter nearby drainages or wetlands and cause an adverse effect on surface water quality. The potential is somewhat limited due to the relative flatness of the terrain and existing vegetation, which could slow or stop sediment movement. However, in construction areas immediately adjacent to surface water drainages or wetlands, there would be increased potential for affecting storm water quality.

Construction activities utilize vehicles, equipment, chemicals and oils in conducting day-to-day project construction. The use of these components can sometimes result in leaks or spills to the ground, which could potentially cause surface water contamination. In addition, a construction site would have chemical toilets in various locations available for use by the construction crews. Although highly unlikely, the chemical toilets can develop leaks, which could potentially result in contamination of surface water, especially during storm events.

The proposed project would **implement** several programs to minimize the potential for construction activities to impact surface water quality. Under federal and state regulations, the project would be required to develop and implement a SWPPP for the construction phase. The SWPPP would identify all the possible activities and incidents that could contaminate storm water or surface water and would contain Best Management Practices (BMPs) that would be implemented to prevent contamination. In addition, the proposed project would be required to implement an Erosion Control Plan that would be specifically focused on procedures and practices to prevent transport of sediment. Examples of BMPs and related measures include installation of silt fences, installation of hay bales in storm water channels, installation of a storm water retention pond to collect storm water generated on the plant site, procedures for handling chemicals and oils,

emergency response procedures and maintenance of spill response equipment. All construction personnel, including contractors, would be trained on these plans and would be expected to implement all appropriate measures. The construction areas would be inspected on a biweekly basis or after a storm event for implemented prevention and management measures, evidence of leaks or spills and developing erosion areas. These inspections would be documented and identified problems would be addressed immediately.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Pipeline Hydrostatic Test Water

In addition, the proposed project may generate hydrostatic test water in the later phases of the construction schedule. Water is used to fill certain plant pipelines and tanks to confirm their structural integrity and prove that they will not leak. Raw water from the Columbia River would be used for this purpose – the resulting water, after testing, may have very small concentrations of oil and suspended solids. Depending on where and when the hydrostatic testing occurs, the water may be disposed of in the power plant's cooling water system, may be hauled off and disposed of by a licensed contractor or discharged under the plant's NPDES discharge permit. Discharge under the permit would require that the hydrostatic test water meet specific discharge limits.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Operation Storm Water Management

Storm water from the proposed project would be collected in storm drains, storm sewers and surface swales and channels. These structures would drain to a retention pond designed to store water from a 25-year, 24-hour storm event. Accumulated storm water would be pumped to the cooling system for re-use, allowed to evaporate *in the storm water detention pond or added to the plant discharge holding pond, which is piped to Cold Springs Reservoir, if necessary*. Storm water that is collected in the power block area would be routed to oil/water separators before draining to the *detention pond*. The oil phase collected in the oil/water separators would be removed by a licensed contractor on a periodic basis. The oil/water separators and retention pond would be inspected on a regular basis for operating condition, oil and solids accumulation and

available capacity. Since storm water would either be recycled or evaporated, it would have no effect on surface or groundwater quality. Access roads to the facility would be constructed and maintained according to Umatilla County standards and/or CTUIR standards. Exposure of contaminants to storm water would be negligible.

Under federal regulations, the proposed project also would be required to develop and implement a SWPPP for the operating phase. The SWPPP would identify all the possible activities and incidents that could contaminate storm water or surface water and would contain BMPs that would be implemented to prevent contamination. BMPs would include procedures for handling chemicals and oils, erosion control measures, preventive maintenance programs, structural controls such as rip-rap and berms and non-structural controls such as training and inspections. All plant personnel would be trained annually on these plans and would be expected to implement all appropriate measures.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Sanitary Sewage Management

Because the plant would be designed to operate with a small staff of operating personnel, the volume of sanitary sewage generated on a daily basis would be relatively small, less than 1,000 gallons per day. Sanitary sewage would be pumped to the *City of Umatilla's* water treatment facility. ***The sanitary sewer line from Wanapa Energy Center would be constructed in the water supply pipeline ROW and connect to the City of Umatilla's existing sanitary sewer system south of the Two Rivers Correctional Facility, near Beach Access Road.*** As an alternative, *sanitary sewage* may be piped to a septic tank and leach field located on site. This septic system would be designed and installed according to the Umatilla County's engineering standards and regulations. It would be inspected on a regular basis and cleaned out when necessary. Treated sewage from the septic system would slowly percolate into the ground and would not have a significant adverse effect on groundwater or surface water quality.

Recommended Mitigation Measures: No measures beyond those included in the proposed project are recommended.

Potable Water

Potable water for use at the Wanapa Energy Center would be provided by a pipeline constructed in the main water supply pipeline ROW. This potable water pipeline would likely connect to the City of Umatilla's potable water system south of the Two Rivers Correctional Facility, near Beach Access Road.

Recommended Mitigation Measures. *No measures beyond those included in the proposed project are recommended.*

Chemical Spills

Chemicals and oils would be stored at the proposed facility in aboveground tanks, containers or drums. All storage containers would be located inside buildings and/or in secondary containment. Secondary containment would be designed to hold the entire contents of the container if a spill or leak occurred. If a spill or leak occurred outside secondary containment during transport of the container or filling of a tank, the spill would flow into the storm water collection system and the storm water retention pond. The pond would contain the spill until clean-up could be implemented. The proposed plant also would have spill response equipment on hand to be able to contain and clean up spills immediately. Spills to the ground surface would be cleaned up immediately by trained plant personnel. A chemical or oil spill at the proposed power plant would not adversely affect surface or groundwater quality.

Recommended Mitigation Measures: No measures beyond those included in the proposed project are recommended.

3.3.2.2 Groundwater

No groundwater use or discharges to groundwater are proposed. Therefore, no groundwater quality impacts are predicted.

3.3.3 Proposed Action Impact Summary

Project construction would result in localized disturbance to surface soils at the plant site, pipeline corridors, access road, and transmission line route. By implementing erosion control measures as

part of the SWPPP, no water quality impacts would occur in intermittent streams or canals located within or near the project study area. No perennial streams are present in the project study area. As part of gas pipeline construction, Columbia River water would be used for hydrostatic testing. The withdrawal quantity, which is part of an existing water right (Port of Umatilla regional water supply system), would not result in a measurable change in Columbia River flow. If hydrostatic test water is discharged to intermittent drainages or upland areas, water quality would meet NPDES requirements.

The impacts of project operation on water resources involve water withdrawal, water discharge, and management of chemical spills or leaks. Approximately **12.4** cfs (average) or **17.7** cfs (maximum) of Columbia River water under an existing water right would be used for plant operation. The water withdrawal amount would represent less than **0.05** percent of Columbia River flow during the low-flow period. Plant **discharge** water (average of **2.4** cfs and maximum of **3.4** cfs) would be treated **for oil and grease, pH, and temperature modification** and piped to the Cold Springs Reservoir. Due to the relatively small discharge quantity, the incremental daily change in reservoir volume, even at its lowest level, would be less than **0.5** percent. By meeting NPDES requirements, **plant** discharge water would not affect water quality in the reservoir. Storm water and sanitary sewage management would be required during plant operation to ensure that there would be no impacts on surface water near the plant site. The potential effects of a chemical spill at the plant site would be minimized by implementing a spill response plan.

Project construction and operation would not affect groundwater resources, since aquifers are located at least 75 feet below the surface. Groundwater would not be used for water sources or discharge purposes.

3.3.4 Component Alternatives Impact Summary

The relative water resource effects of the component alternatives would be nearly the same as the Proposed Action for both the gas/water discharge pipelines and transmission line alternatives. It is likely that similar volumes of hydrostatic test water would be used for each pipeline alternative regardless of length because the same water can be used again in a different hydrostatic test segment. Table 3.3-4 provides a comparison of the Proposed Action (plant discharge to Cold Springs Reservoir) with the Alternative 1 (plant discharge to the Columbia River).

Table 3.3-4
Summary Comparison of Plant Discharge Water Location Alternatives

| | No Action | Proposed Action | Alternative 1 |
|-----------------------|---|--|---|
| Resource/Impact Issue | | | |
| Water Resources | No new water withdrawals or discharges would occur. | Average annual water demand from the Columbia River would be 12.4 cfs, and maximum demand would be 17.7 cfs. Under the lowest flows recorded in the period of record, project withdrawals would represent 0.04 percent of river flow. Power plant discharge water would be discharged to Cold Springs Reservoir in accordance with a NPDES permit obtained from the Oregon Department of Environmental Quality. It is unlikely that a diffuser would be needed to meet water quality discharge standards, but would be installed on the reservoir bed if needed. Plant discharge water would mix with existing stored water in the reservoir and would be distributed for seasonal irrigation. Little or none of this water would be returned to the Columbia River because of uptake by crops, evaporation, and loss to the groundwater system. | Average annual water demand from the Columbia River would be the same as the Proposed Action. Power plant discharge water would be discharged to the Columbia River (Lake Wallula) upstream of McNary Dam in accordance with a NPDES permit obtained from the Oregon Department of Environmental Quality. It is highly likely that a high volume diffuser would be installed on the bed of Lake Wallula to meet temperature and total dissolved solids (TDS) discharge standards for this segment of the Columbia River. Based on the number of times that the water is used in the power plant cooling process, the water discharged directly back to the Columbia would represent about 20 percent of the volume withdrawn. |

3.4 Biological Resources

3.4.1 Existing Environment

3.4.1.1 Vegetation/Land Cover

The study area for vegetation includes the areas proposed for new project surface disturbance and adjacent land. To estimate the effects on natural vegetation communities as well as human land uses, an overall land cover map (**Figure 3.4-1**) was prepared that encompasses all project components plus a 0.5 mile buffer on all sides. The map was based on recent (mid-1990s) aerial photography, and land cover types were verified by ground reconnaissance surveys. A second map (**Figure 3.4-2**) provides a more detailed view of the land cover between the plant site and the McNary substation.

The regional vegetation is located in the Steppe Region of northeastern Oregon. The dominant vegetation community is a shrub-steppe with big sagebrush (Franklin and Dyrness 1973). These natural communities have been highly modified by the development of irrigated and dryland agriculture wherever soils are sufficiently deep to support agricultural crops and adequate natural precipitation or irrigation water are available.

Land cover types were categorized in accordance with the criteria established by the Oregon Department of Fish and Wildlife (ODFW) for mitigation of wildlife habitat. These categories are defined by their vegetation assemblages as well as their value as wildlife habitat. The land cover types potentially affected by project components are discussed below.

Shrub-steppe

ODFW Category 4 – Shrub-steppe, moderately grazed or weedy (SS4). Shrub-steppe communities occur extensively across basalt outcrops on the Wanaket Wildlife Area south of the plant site where agricultural development is not possible because of shallow soils (Starbuck Rock Outcrop Complex, Quincy-Rock Outcrop Complex). The dominant species in basalt outcrop areas are stiff sagebrush and Sandberg bluegrass. Big sagebrush is the dominant species in pockets of deeper soils in depressions in the basalt. In 2001, a wildfire burned across the northern and eastern portion of the Wanaket Wildlife Area, removing the shrub and grass cover. The current community in the burned area is dominated by cheatgrass, filaree, and weedy mustards. Small patches of big

sagebrush with an understory of cheatgrass are located along the margins of croplands between U.S. Highway 730 and the Stanfield compressor station. Because of the low annual precipitation and the cheatgrass competitive advantage for soil moisture, the recovery of the shrub component on the Wanaket Wildlife Area is expected to be long-term (likely 25 to 50 years). This habitat provides feeding and nesting areas for birds adapted to disturbed areas (e.g., meadowlark), and habitat for several species of small mammals (mice and rabbits).

Wetlands

ODFW Category 3 - Permanent Ponds (WP3). As part of a mitigation program for the inundation caused by the McNary Hydroelectric Facility (CTUIR and BPA 2001a), a series of ponds were developed on the Wanaket Wildlife Area. These ponds are located in depressions in basalt outcrops, and are fed by water pumped from the Columbia River. The water is pumped over the basalt bluff into an irrigation pipeline that extends toward the southwest. Water is then released from the pipeline into about 15 miles of canals that drain into the individual ponds. Water rights allow the CTUIR to apply a total of 4,764 acre-feet per water per month from March 1 to October 31. Overall water withdrawal does not exceed 7.8 cubic feet per second. The Wanaket Wildlife Area contains about 160 acres of emergent wetlands. Ponds range in size from 0.25 to 10.5 acres. Woody vegetation includes Russian olive, cottonwood, peach-leaf and Columbia River willows. Emergent vegetation rooted along the margins of ponds include cattails and bulrushes. Patches of inland salt grass, reed canary grass, and creeping spike rush occupy seasonally wet soils. These wetlands provide feeding and rearing habitat for shore birds and waterfowl.

Other mapped wetland areas include: 1) an area around an irrigation water regulating pond below the Cold Springs Reservoir; 2) irrigated pasture south of McNary, which is an irrigation-induced wetland caused by cropland drainage further to the east (see below); and 3) the fringe of cottonwood trees, Russian olive, peach-leaf willow, sand bar willow, and leadplant around Cold Springs Reservoir.

Open Water

ODFW Category 2. The Columbia River channel, and the surface of Cold Springs Reservoir are open water features within the study area. Both areas provide fisheries habitat, and resting and feeding areas for waterfowl and shorebirds.

Irrigated Cropland

ODFW Category 4 - Irrigated pasture and row crops (AW4). Irrigated cropland occurs on deep sandy soils in the central portion of the study area that would be crossed by the natural gas and discharge water pipelines between U.S. Highway 730 and the Stanfield compressor station. Cold Springs Reservoir represents the primary water supply for this agricultural area. Grain, corn, and hay crops are grown under center pivot irrigation systems and in rectangular fields watered by furrow irrigation. Grain field stubble provides feeding areas for waterfowl and game birds (pheasants), and field tree windbreaks provide nesting and perching habitat for a variety of song birds and raptors.

Irrigated Pasture

ODFW Category 4 - Irrigated pasture and row crops (AW4). Irrigated pasture occurs primarily in the western portion of the study area, south of McNary. This area is watered by agricultural drains, and has been invaded by Russian olive and cottonwood trees in areas that remain perennially wet. This pasture area is an irrigation-induced wetland, where soils remain saturated over long periods of time. Understory species include bulrush, spike rush, and a variety of pasture grasses.

Other Land Cover Categories

The following human land use categories are present in the study area:

- **Industrial.** The industrial zone south of McNary Dam, which includes the Port of Umatilla, the BPA McNary Substation, an oil terminal, a lumber and wood chip facility, several small warehouse buildings and businesses, and the TRCI.
- **Commercial/Residential.** Mixed commercial and residential areas located on both sides of U.S. Highway 395 between Hermiston and the U.S. Highway 395/U.S. Highway 730 intersection.
- **Rural Residential.** The residential development at McNary, and the adjacent golf course; a large area of small acreage rural residences on both sides of Diagonal Road between Hermiston and the Diagonal Road/U.S. Highway 730 intersection; residential developments near Hat Rock State Park; and individual farmsteads within blocks of irrigated cropland.

-
- Recreation. McNary Beach Park and Hat Rock State Park.
 - Highway. The major roadways crossing the study area: U.S. Highway 730, U.S. Highway 395, and Diagonal Road.
 - Railroad. The Union Pacific Railroad (UPRR) road that runs between Hermiston and the south bank of the Columbia River.

Noxious and Invasive Weeds

Since agricultural development began in the late 1800s, a variety of exotic plant species have become established in croplands and rangelands, and have been distributed by irrigation and animals into adjacent native communities. These species compete with and displace native species. A noxious weed list has been developed for the Wanaket Wildlife Management Area (CTUIR and BPA 2001b), which is likely representative for the study area as a whole. Invasive annual species include cheatgrass, tumbled mustard, Russian thistle, and yellow starthistle. Perennial species that form large patches, and spread by underground rhizomes include perennial pepperweed, Swanson pea, diffuse and Russian knapweeds, and musk and Canada thistles. Russian olive is a small exotic tree species that rapidly invades seasonally wet areas, and grows and reproduces very quickly. Annual weed species represent a fire-hazard during dry seasons. The perennial weed species are usually controlled with herbicides with varying degrees of success. Long-established patches of thistles and knapweed are nearly impossible to eradicate because of their widespread root systems, and their capacity to spread vegetatively from rhizomes when disturbed.

3.4.1.2 Aquatic Species

The study area for aquatic species includes the Columbia River, Wanaket Wildlife Area, Cold Springs Reservoir, and the Umatilla River. The following information summarizes baseline conditions for aquatic species in aquatic habitats within the project study area.

Columbia River

Fisheries. The Columbia River upstream of the McNary Dam supports a mixture of cold water and warm water fisheries. Cold water fish species that are present in the Columbia River upstream and

downstream of the McNary Dam include chinook salmon, coho salmon, steelhead, sockeye salmon, walleye, and white sturgeon. Warm water species include gizzard shad, smallmouth bass, largemouth bass, crappies, and channel catfish. In addition, bull trout (*Salvelinus malma*) potentially use the mainstem Columbia River as a movement corridor between tributaries.

Salmon, steelhead and white sturgeon are anadromous species, which spend their adult stage in the Pacific Ocean and migrate into the Columbia River drainage for spawning and juvenile rearing. The migration of white sturgeon was significantly impacted by the construction of mainstem dams. Above Bonneville Dam, sturgeon now generally spend their entire life within the mainstem reservoirs. Juvenile salmon and steelhead however migrate to the Pacific Ocean before returning to fresh water. Based on adult counts at the McNary Dam, chinook salmon and steelhead usually are the most abundant salmon species. Adult counts for the year 2001 and the 10-year average from 1991 to 2000 are provided in **Table 3.4-1**. The counts represent a total for the months of April through October. The increased numbers of adult salmon in 2001 compared to the 10-year average is largely due to good juvenile outmigration and ocean conditions during the previous years.

Table 3.4-1
Adult Salmon Counts at the McNary Dam, 1991-2001

| Species | 2001 | 1991-2000 (Average) |
|----------------------------------|-------------|----------------------------|
| Chinook salmon (adults) | 437,120 | 112,616 |
| Chinook salmon (<i>jacks</i> *) | 52,664 | 21,441 |
| Steelhead (hatchery stocked) | 398,784 | 122,089 |
| Steelhead (wild) | 94,384 | 14,634 |
| Sockeye salmon | 97,188 | 40,062 |
| Coho salmon (adults) | 22,919 | 3,070 |
| Coho salmon (<i>jacks</i> *) | 1,812 | 376 |

*Sub-adults

Source: USACE 2002.

Salmon species use the mainstem portion of the Columbia River as a migratory route for both adult and juvenile life stages as well as for juvenile rearing. The timing of adult migration occurs during spring, summer, and fall and varies by species and run. Outmigration of smolts (i.e., movement downstream towards the ocean) occurs during the spring and summer months. Additional

information on the salmon species and bull trout is provided in the Threatened and Endangered Aquatic Species section.

The Columbia River fisheries represent a source of substance, a gift of religion, and a foundation of culture for the Tribes. In their treaties, the Tribes reserved the rights to continue fishing on the Columbia River at all usual and accustomed fishing sites.

Wanaket Wildlife Area

The Wanaket Wildlife Area contains 60 ponds or wetland habitats that range in size from approximately 0.25 to 10.5 acres (CTUIR and BPA 2001b). Fisheries in the ponds are limited to carp and mosquitofish. Fish populations in the ponds are limited due to low water levels from 1995 to 1997 when construction and maintenance improvements were completed. Future management plans for the ponds do not include stocking and maintenance of fish species for recreational fishing, since this use is not consistent with the intent of the Wildlife Mitigation Program and funding.

Cold Springs Reservoir

Fish populations in Cold Springs Reservoir are comprised of warm water species. Fish species includes largemouth bass, white crappie, bluegill, yellow perch, and brown bullhead (ODFW 1997). Fishing occurs along the Inlet Canal and Cold Springs Dam. Sampling by the ODFW in 1997 indicated that white crappie and carp were the most abundant fish species, followed by largemouth bass, brown bullhead, yellow perch, and bluegill.

Umatilla River

The Umatilla River contains a mixture of cold water and warm water species. The section of the river near Hermiston is considered a migratory corridor for spring-run chinook salmon, fall-run chinook salmon, coho salmon, and steelhead. These species are present in the spring, fall, or winter. Relatively high temperatures limit the presence of these cold water species in the summer. Creel census data for these species has varied considerably during the past 10 years, with harvest numbers per species ranging from 1 to 1,759 in the lower Umatilla River (ODFW 2003). In recent years, the largest harvests included fall-run chinook and spring-run chinook salmon. Warm water species in the lower Umatilla River consist of largemouth bass, smallmouth bass, black crappie,

yellow perch, and brown bullhead. These fish originate from McKay Reservoir, which is located in a tributary (McKay Creek) to the Umatilla River. Redband trout occasionally may enter the river from McKay Reservoir. However, as discussed for the salmon species, summer temperatures limit use to sporadic occurrence.

3.4.1.3 Wildlife

Wildlife habitat within the project study area consists primarily of a fragmented patchwork of irrigated agricultural lands, grasslands, and remnant areas of shrub-steppe. Although shrub-steppe habitat is considered an important habitat type for area wildlife, the shrub-steppe habitat within the project area has received considerable habitat fragmentation resulting from increased development and human presence within the area. The quality of this habitat has been further degraded by the encroachment of nonnative weed species to the area. Other wildlife habitats within the area include wetland and riparian habitats. Riparian woodlands within the study area occur primarily along the banks of ephemeral and perennial creeks, lakes, ponds, and drainages. Wetlands within the study area are limited to small depressional areas and areas along the edges of ephemeral and perennial water bodies.

Wildlife habitat was characterized based on a review of aerial maps and a site reconnaissance of the project component areas. Wildlife use was determined through a literature review, agency contacts, and on-site surveys for sensitive species. The following information summarizes wildlife use in the project study area.

Game Species

Big game species in the project study area include mule deer and elk. Mule deer occur throughout the year in all habitat types located within the project study area. However, higher quality habitats and increased densities of deer would typically occur within riparian habitat that provide adequate shrub layers for both food and shelter. Within the project study area, mule deer occur at relatively low densities. Mule deer numbers within the Wanaket Wildlife Area approximate 30 animals **year long**. The Wanaket Wildlife Area and Cold Springs National Wildlife Refuge provide wintering habitat for mule deer. Up to 75 to 80 mule deer have been reported on the Wanaket Wildlife Area during winter (Quaempts 2003). Elk use within the project area would be limited primarily to the Cold Springs National Wildlife Refuge in the southeast portion of the study area. On rare occasions elk may wonder off the Cold Springs National Wildlife Refuge to surrounding habitats. One elk

was observed in the Wanaket Wildlife Area several years ago. Elk primarily graze on grasses and forbs, but also utilize woody vegetation in the winter months.

Game bird species present in cropland and shrub-steppe habitats include California quail, ring-necked pheasant, and mourning dove. Hungarian partridge and chukar also occur along the Columbia River (Quaempts 2003). California quail and ring-necked pheasant are hunted on the Wanaket Wildlife Area.

Wetland areas in the Wanaket Wildlife Area and Cold Springs Reservoir provide habitat for waterfowl and shorebirds. Relatively large numbers of ducks and geese utilize Cold Springs Reservoir from October through February. Based on aerial waterfowl surveys during the fall and winter of 2002-2003, mallard and pintail accounted for most of the dabbling ducks with smaller numbers of gadwall, American widgeon, green-winged teal, and northern shoveler. Diving duck species such as canvasback, scaup, bufflehead, goldeneye, redhead, and merganser were generally lower in numbers than the dabbling species. Wintering geese mainly are represented by Canada geese with a few white-fronted geese. Small numbers of tundra swans also were observed. The greatest number of waterfowl was observed during February with 22,207 ducks, 6,720 geese, and 10 swans being tallied. Nearly 5,000 of these birds were observed on Memorial Marsh. Waterfowl counts for the period 1981 through 2002 have ranged from 12,300 in 2000/2001 to 162,610 in 1986/1987 (Allen 2003).

Waterfowl also represent an important biological component of the Wanaket Wildlife Area. From 1993-2002, a total of 18 duck species and 4 goose species have been documented on the Wildlife area (**Table 3.4-2**). The most common duck species that were observed include mallard, widgeon, and green-winged teal. Other duck species that are commonly observed on the Wildlife area include northern shoveler, pintail, bufflehead, gadwall, ringneck, and goldeneye. Wintering geese that have been observed on the Wildlife area include Canada and snow geese (Quaempts 2003).

Non-game Species

A diversity of non-game species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupy a variety of trophic levels and habitat types within the project study area. Non-game species include an assortment of small mammals including shrews, bats, squirrels,

**Table 3.4-2
Wanaket Wildlife Area Hunter Use and Harvest Summary**

| Species Harvested | 1993-94 | 1994-95 | 1995-96 ¹ | 1996-97 ² | 1997-98 | 1998-99 | 1999-00 | 2000-01 | 2001 - 02 ³ | Total | Annual Average | Percent of Harvest |
|---------------------------|---------|---------|----------------------|----------------------|---------|---------|---------|---------|------------------------|-------|----------------|--------------------|
| Geese | | | | | | | | | | | | |
| Canada | 5 | 31 | 7 | 0 | 5 | 14 | 38 | 9 | 1 | 109 | 14 | 31 |
| Lesser Canada | 16 | 62 | 14 | 25 | 19 | 9 | 43 | 21 | 2 | 209 | 26 | 59 |
| Taverner Canada | | 10 | 7 | | 6 | 3 | 8 | | | 34 | 4 | 10 |
| White-Fronted | | 1 | | | | | | | | 1 | 2 | 5 |
| Snow | | | | | | | | | | | | |
| Ross | | | | | | | | | | | | |
| Ducks | | | | | | | | | | | | |
| Mallard | 279 | 921 | 2806 | 1109 | 1693 | 1198 | 1036 | 1206 | 206 | 10248 | 1281 | 72.4 |
| Pintail | 13 | 18 | 44 | 11 | 53 | 59 | 41 | 63 | 18 | 302 | 38 | 2.1 |
| Gadwall | 3 | 5 | 23 | 20 | 34 | 63 | 56 | 35 | 11 | 239 | 30 | 1.7 |
| G.W. Teal | 27 | 31 | 201 | 74 | 133 | 145 | 83 | 115 | 28 | 809 | 101 | 5.7 |
| Wigeon | 20 | 60 | 210 | 77 | 258 | 185 | 205 | 147 | 23 | 1162 | 145 | 8.2 |
| Shoveler | 6 | 56 | 53 | 11 | 92 | 100 | 68 | 41 | 7 | 427 | 53 | 3.0 |
| Scaup | 9 | 14 | 24 | 7 | 23 | 22 | 16 | 8 | | 123 | 15 | 0.9 |
| Redhead | 0 | 2 | 6 | 3 | 3 | 10 | 6 | 2 | | 32 | 4 | 0.2 |
| BW Teal | | | | | | 4 | | 2 | 1 | 6 | 1 | 0.0 |
| Bufflehead | 10 | 18 | 22 | 19 | 57 | 28 | 71 | 14 | 1 | 239 | 30 | 1.7 |
| Goldeneye | 0 | 13 | 10 | 20 | 25 | 30 | 41 | 9 | 1 | 148 | 19 | 1.0 |
| Cinnamon Teal | 2 | 3 | 9 | 5 | 4 | 2 | 10 | 4 | 2 | 39 | 5 | 0.3 |
| Canvasback | 0 | 5 | 3 | 1 | 1 | 2 | 2 | 3 | | 17 | 2 | 0.1 |
| Ringneck | 1 | 13 | 56 | 16 | 14 | 32 | 62 | 20 | 8 | 214 | 27 | 1.5 |
| Ruddy | 1 | 7 | 14 | 1 | 5 | 3 | 8 | 3 | | 42 | 5 | 0.3 |
| Merganser | 1 | | 5 | 4 | 2 | 4 | 0 | 5 | 1 | 21 | 3 | 0.1 |
| Woodduck | 2 | | 9 | 4 | 14 | 19 | 10 | 5 | | 63 | 8 | 0.4 |
| Unknown | | | | | | 7 | 2 | 9 | | 18 | 2 | 0.1 |
| Upland | | | | | | | | | | | | |
| Pheasant | 38 | 97 | 121 | 162 | 185 | 196 | 105 | 89 | 57 | 993 | 124 | 7.0 |
| Quail | 25 | 118 | 169 | 242 | 256 | 328 | 172 | 228 | 59 | 1538 | 192 | 10.9 |
| Snipe | 1 | | | | 4 | 9 | 1 | 11 | 7 | 26 | 3 | 0.2 |
| Coot | 1 | 2 | 7 | 3 | 25 | 24 | 19 | 11 | 2 | 92 | 12 | 0.7 |
| TOTAL GEESE | 21 | 104 | 28 | 25 | 30 | 26 | 89 | 30 | 3 | 353 | 44 | |
| TOTAL DUCKS | 374 | 1166 | 3495 | 1382 | 2411 | 1913 | 1717 | 1691 | 308 | 14149 | 1769 | |
| TOTAL UPLAND BIRDS | 65 | 217 | 297 | 407 | 470 | 557 | 297 | 339 | 125 | 2649 | 331 | |

| Hunter Effort | 1993-94 | 1994-95 | 1995-96 ¹ | 1996-97 ² | 1997-98 | 1998-99 | 1999-00 | 2000-01 | 2001 - 02 ³ | Total | Annual Average |
|-----------------------|---------|---------|----------------------|----------------------|---------|---------|---------|---------|------------------------|-------|----------------|
| # Hunters | 487 | 696 | 1419 | 846 | 1400 | 1267 | 1312 | 1098 | 299 | 8525 | 928 |
| Ave. Hours Per Hunter | 3.4 | 4.3 | 4.4 | 4.2 | 3.8 | 4.3 | 3.3 | 3.8 | 3.1 | 3.9 | 4.1 |
| Total Hours | 1670 | 2748 | 6223 | 3551 | 5306 | 5448 | 4272 | 4142 | 773 | 33360 | 3652 |

¹In the 1995-96 Waterfowl Season, duck harvest limits were increased from 4 to 6 birds.

²In the 1996-97 Waterfowl Season, duck harvest limits were increased to 7 birds. However, morning waterfowl hunts were reduced from 30 to 16 hunters.

³In 2001 - 02, the north side of Wanaket was closed to hunting, reducing the number of hunters and the harvest. Additionally, harvest reporting was voluntary/optional.

rabbits, rats, and mice. These small mammals provide a substantial prey base for the areas predators including mammals (coyote, fox, badger, skunk), raptors (eagles, hawks, accipiters, owls), and reptile species. A number of reptile (turtles, lizards) and amphibian (toads, frogs) species also occur within the project study area. A number of these species depend on the limited riparian and wetland habitats within the project study area.

Water birds that occur within the project study area include great blue heron, killdeer, common snipe, greater and lesser yellowlegs, sandpiper species, gulls and tern species, black-necked stilt, American avocet, Wilson's phalarope, long-billed dowitcher, and white pelican. Two great blue heron rookeries have been documented on the Cold Springs Reservoir refuge in Memorial Marsh and along Cold Springs Creek (Allen 2003).

Non-game birds encompass a variety of passerine and raptor species. Non-game birds include a diversity of neotropical migrants - birds that breed in North America and winter in the neotropical region of South America. These birds are considered integral to natural communities and act as environmental indicators based their sensitivity to environmental changes. Common bird species that occur within the project study area include horned lark, meadowlark, American robin, song sparrow, white-crowned sparrow, brown-headed cowbird, and Brewer's blackbird.

Habitat within the project study area also supports a variety of raptor species within the project study area. Species observed in the Wanaket Wildlife Area and Cold Spring National Wildlife Refuge include bald eagle, red-tailed hawk, northern harrier, American kestrel, barn owl, great-horned owl, and burrowing owl (Allen 2003; Quaempts 2003). Other raptor species that have been observed within the project study area include Swainson's hawk, rough-legged hawk, Cooper's hawk, sharp-shinned hawk, osprey, short-eared owl, and screech owl (Allen 2003). Mature trees within the study area provide potential nesting habitat for many of these raptor species. Breeding generally occurs from March through June depending upon the species. Additional distribution and habitat information for the bald eagle is discussed in the Threatened and Endangered Wildlife Species.

Raptor surveys were conducted on the Wanaket Wildlife Area and the adjacent mainstem of the Columbia River on June 8 and 9, 2004. A total of three active nests and two inactive nests were recording in the wildlife area. Of the three active nest sites two nests in the western portion of the wildlife area were occupied by red-tailed hawks and one nest site north of the Two Rivers Correctional Institution was occupied by osprey (Quaempts 2004).

3.4.1.4 Special Status Species

On July 8, 2003, the BIA wrote letters to NOAA and the USFWS requesting an updated list of species to be considered in the analysis of the Wanapa Energy Center. In letters dated July 23, 2003, NOAA and USFWS provided updated species lists. These lists were reviewed to determine which species could potentially be affected by project construction and operation.

Federal Species

Federally listed fish species in the middle Columbia River include chinook salmon, sockeye salmon, steelhead, and bull trout (**Table 3.4-3**). The following information summarizes the distribution, habitat use, and life history characteristics for each species and their ESU, if applicable.

Table 3.4-3
Federally Listed or Proposed Species in the Middle Columbia River

| Species | ESU | Federal Status | Responsible Agency |
|----------------|---------------------------------|-----------------------|---------------------------|
| Chinook salmon | Upper Columbia River spring-run | Endangered | NOAA |
| | Snake River spring/summer-run | Threatened | NOAA |
| | Snake River fall-run | Threatened | NOAA |
| Sockeye salmon | Snake River (Salmon River) | Endangered | NOAA |
| Steelhead | Middle Columbia River | Threatened | NOAA |
| | Upper Columbia River | Endangered | NOAA |
| | Snake River Basin | Threatened | NOAA |
| Bull trout | Not applicable | Threatened | USFWS |

Salmon and Steelhead Trout. Three chinook salmon ESUs utilize the Middle Columbia River as a migratory route for adults and juveniles: Upper Columbia River spring-run, Snake River spring/summer-run, and Snake River fall-run. Critical habitat was designated for the three ESUs, which are located upstream of the proposed Wanapa Energy Facility. The timing of the adult spawning runs into the Columbia River drainage occurs during the spring, summer, and fall.

Juvenile chinook salmon may spend from 3 months to 2 years in freshwater before they migrate downstream in the Columbia River to the Pacific Ocean.

The Snake River sockeye salmon ESU utilizes the Columbia River as a migratory route for adult spawners and juveniles. Critical habitat was designated in the Snake River drainage, which is located upstream of the proposed Wanapa Energy Facility. The migration period generally ranges from June through August for adult spawning runs and juvenile outmigration. Juvenile sockeye salmon usually spend 1 to 2 years in freshwater and then they migrate to the Pacific Ocean. After 1 to 3 years, they return to the Columbia River for their spawning migration.

Three steelhead ESUs utilize the Middle Columbia River as a migratory route. The Middle Columbia ESU occupies the Columbia River Basin from above the Wind River in Washington and the Hood River in Oregon including the Yakima River in Washington (NMFS 2002a). The Middle Columbia River also lies within critical habitat designated for the Middle Columbia steelhead ESU. All steelhead in the Columbia River Basin are summer-run, inland steelhead. Life history characteristics of most Middle Columbia steelhead rear for 2 years and spend 1 to 2 years in the ocean before they re-enter freshwater. Adults can remain in freshwater for up to a year before they spawn. Nonadromous Columbia River redband trout can coexist with the anadromous within this ESU (NMFS 2002a). The Upper Columbia River ESU and Snake River ESU occupy habitats located upstream of the Middle Columbia River (i.e., upstream from the Yakima River for the Upper Columbia ESU and the Snake River Basin in Washington, Oregon, and Idaho for the Snake River ESU).

The Middle Columbia River above and below the McNary Dam also is considered essential fish habitat (EFH) for salmon species, as regulated under the Magnuson-Stevens Fishery Conservation and Magnuson Act (NMFS 2002b). Freshwater EFH includes all streams, lakes, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas located upstream of certain impassable man-made barriers and naturally impassable barriers. EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. All habitat that was historically used by coho and chinook salmon is designated as EFH.

The occurrence of four federally listed salmon species (i.e., spring-run chinook salmon, fall-run chinook salmon, coho salmon, and steelhead) in the Umatilla River) is discussed in the Umatilla River Fisheries section.

Bull Trout. The Columbia River near the McNary Dam is located within the Columbia River Distinct Populations Segment (DPS) for bull trout. The Columbia River Basin Bull Trout DPS includes all naturally spawning populations in the Columbia River Basin within the U.S. and its tributaries, excluding bull trout found in the Jarbidge River in Nevada. Adults and subadult bull trout use the Columbia River for foraging and overwintering. Movement out of tributaries into the Columbia River usually occurs in the early summer and seems to coincide with snowmelt runoff. Movement back into tributaries seems to occur mainly in September through November after spawning is completed (Rhew 2002). Bull trout spawning and rearing is restricted to relatively pristine cold streams usually within the headwater reaches (Rieman and McIntyre 1993). However, adults can reside in reservoirs, lakes, and coastal areas.

Bald Eagle. Individual bald eagles are observed annually at the Wanaket Wildlife Area during the winter. No historic or active communal roost sites, winter roosts, winter concentration areas have been identified within the area proposed for project facilities. The nearest historic bald eagle winter roost is located approximately 2 miles east of the plant site at Hat Rock State Park.

Detailed impact assessments for *these* species *are* presented in Appendix A, *Wildlife Surveys and Assessments*.

3.4.1.5 Sensitive State Species

A total of 19 terrestrial and aquatic special status species was identified as potentially occurring within the project area (Quaempts 2002; USFWS 2003; Oregon Natural Heritage Program 2002). These species, their associated habitat, and their potential for occurrence within the project study area are summarized in Appendix A, **Table A-1**. Occurrence potential within the study area was evaluated for each species based on its habitat requirements and/or known distribution. Based on these evaluations, four terrestrial species (Washington ground squirrel, white-tailed jackrabbit, yellow-billed cuckoo, black-throated sparrow) and two aquatic species (blotched tiger salamander and Columbia spotted frog) were eliminated from detailed analysis. The remaining 13 species are analyzed in the following sections.

Terrestrial special status species surveys were conducted within the Wanaket Wildlife Area and along associated utility corridors in 2002 and 2004 (Kronner 2004; Quaempts 2003, 2004). Species that have been identified within the Wanaket Wildlife Area include bald eagle, burrowing owl, long-billed curlew, and American white pelican (Quaempts 2003, 2004). The

American white pelican was also located on the Cold Springs National Wildlife Refuge during the 2004 surveys (Kronner 2004).

Two amphibian/reptile surveys were conducted from April 29 through May 1 and May 22 through 24, 2002, in the Wanaket Wildlife wetlands. The purpose of the surveys was to determine if the federal candidate Columbia spotted frog (*Rana luteiventris*) or four state-sensitive species, blotched tiger salamander (*Ambystoma trigrinum melanosticum*), western painted turtle (*Chrysemys picta*), northern leopard frog (*Rana pipiens*), western toad (*Bufo boreas*), and Woodhouse toad (*Bufo woodhousii*), are present. Of 69 wetlands examined as potential habitat for the sensitive species, 53 had water and were surveyed at least once for amphibians and reptiles. None of the sensitive frog or salamander species were observed in any of the wetlands. Western painted turtle was observed in 24 wetlands (Appendix A, **Tables A-2** and **A-3**). Sixteen wetlands contained frog species such as bull frog, Great Basin spadefoot, and Pacific tree frog.

3.4.2 Environmental Consequences and Mitigation

3.4.2.1 Vegetation/Land Cover

Upland Native Vegetation Disturbance and Recovery

The proposed power plant would occupy approximately 47 acres of a 195-acre site. Construction of the access road would remove approximately 4 acres. Vegetation within the power plant footprint and most of the access road consists of grassland-steppe habitat that has been burned. This shrub-steppe habitat for these project components is considered low quality due to the loss of shrub species as a result of the burn in 2001.

Construction of the gas, discharge water, and intake water pipelines would result in temporary disturbance to vegetation and wildlife habitat. Vegetation would be removed within a 100-foot width for the gas and discharge pipelines, and a 50-foot-width for the water intake pipeline. The estimated disturbance to vegetation types in acres is listed in **Table 3.4-4**. The majority of the disturbance would occur in irrigated cropland. Approximately 22 acres of grassland-steppe and shrub-steppe habitat would be disturbed during pipeline construction. Most of this disturbance area is grassland-steppe, with smaller patches of shrub-steppe. After construction is completed, the disturbed areas would be reclaimed using a seed mix recommended by the Natural Resource Conservation *Service* District *office* in Pendleton for native grasses or the CTUIR Wanaket

Wildlife Management Area staff. The estimated recovery period for grasses would be one growing season. Shrubs would require 25 to 50 years to naturally recolonize the affected areas.

Table 3.4-4
Proposed Action Construction Disturbance (Acres) to Vegetation and Wildlife Habitat for the Gas/Water Discharge and Water Supply Pipelines

| Vegetation/Wildlife Habitat | Gas/Plant Discharge Water Pipelines | Water Intake Pipeline¹ | Access Road |
|------------------------------------|--|--|--------------------|
| Grassland and shrub-steppe | 23.4 | 1.7 | 8.5 |
| Irrigated cropland | 81.6 | 0 | 0 |
| Wetland | <0.1 | 0 | 0 |
| Rural residential | 21.9 | 0 | 0 |
| Industrial | 0 | 1.7 | 0 |
| Highway/railroad | 1.1 | 0 | 0 |
| Total | 128.0 | 3.4 | 8.5 |

¹Water supply line ROW would be utilized for potable water and sanitary sewer pipeline.

Construction of the transmission line would remove vegetation at the power pole sites and cause temporary surface compaction from vehicle and equipment use. The types of vegetation and wildlife habitat in the transmission ROW are listed in **Table 3.4-5**. The majority of the affected habitat would consist of grassland and shrub-steppe and irrigated cropland. Vegetation would recover from surface compaction within the first growing season. Permanent vegetation removal would occur at tower sites. Each site would require a temporary work area of 0.25 acre and a permanent area of 0.05 acre. In total, tower construction would result in temporary disturbance to 6.3 acres and permanent removal of 1.3 acres for the towers. No permanent disturbance would occur in wetland habitat. Short-term disturbance to cover and foraging areas for wildlife would occur as a result of transmission line construction.

Table 3.4-5
Proposed Action Construction Disturbance (Acres) to Vegetation and Wildlife Habitat for the Transmission Line ROW

| Vegetation/Wildlife Habitat | Acres |
|------------------------------------|--------------|
| Grassland and shrub-steppe | 40.9 |
| Irrigated pasture | 34.8 |
| Wetland | 2.5 |
| Rural residential | 0.2 |
| Industrial | 21.7 |
| Highway | 0.9 |
| Total | 101.0 |

Recommended Mitigation Measures.

VLC-1. The revegetation mixture applied to disturbed soils on the Wanaket Wildlife Area would conform to the future management objectives for the site as described by the Wildlife Area Management Plan (CTUIR and BPA 2001b).

Wetlands Disturbance and Recovery

The proposed pipeline would be routed around the small (less than 1 acre) pond on the Wanaket Wildlife Area south of U.S. Highway 730 (**Figure 3.4-1**). The north-south pipeline trench would be excavated in basalt bedrock, and would intercept and potentially change the general drainage pattern that flows from west to east because water would flow into the trench rather than following existing drainage channels. Where the pipeline intercepts the canals and natural drainage that feeds the Wanaket Wildlife Area wetland ponds, the pipeline trench would be backfilled with low permeability soil, and trench plugs would be placed at frequent intervals to prevent overland water flow from being diverted by the wetland trench. After project completion, the pipeline ROW would be monitored to verify that the natural drainage is restored. If the surface drainage is determined to have been modified, the pipeline operator would return to restore and redirect drainage channels.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Noxious Weeds

There is a high potential that seeds and rhizomes would be transported by excavation equipment wheels, tracks, and blades. Of particular concern is moving weeds into agricultural fields that are currently weed free, or expanding the range of weeds into native plant communities.

Recommended Mitigation Measures.

VLC-2. A pre-construction weed inventory would be completed along the approved pipeline route to determine the location of weed populations within and adjacent to the construction ROW. Excavation equipment would be cleaned (air pressure hoses, or wash stations) after crossing weed

infestation areas and entering weed-free areas. All soil excavated from weed-infested areas would be replaced in the same location.

VLC-3. Any hay used as mulch would be certified as weed-free prior to application.

Cooling Tower Drift

Cooling water vapor and droplets would drift from the towers and be deposited on surface soils and vegetation. Based on air quality analyses, drift could occur within an approximate 0.25-mile radius from the towers. Vegetation within the drift area would mainly include grasses and weedy species. Wetland vegetation is present at two sites located approximately 400 and 1,300 feet east of the west tower. The total solids concentration for the drift plume is approximately 1,600 mg/l. Chemical components in the drift consist of calcium, magnesium, potassium, sulfates, phosphates, and other minerals. Studies on effects of saline drift on vegetation has shown that crops such as cotton, alfalfa, and cantaloupe were not affected at deposition rates of 6,908 kilogram/kilometer² (BPA 2001). This effect level is more than 300 times higher than the estimated deposition rate for the Wanapa Project. It is assumed that native grasses and wetland plant species would be affected at similar or higher concentrations as shown for the crop species. Therefore, cooling tower drift is not expected to affect vegetation.

3.4.2.2 Aquatic Species

Diversion of Water from the Columbia River

Water for the proposed power plant would be obtained from the Port of Umatilla's regional raw water supply system under an existing municipal water right and use permit (*Permit No. 49497*). **Maximum water** withdrawal for the project would be **8 to 12** million gallons per day, which represents **8 to 12** percent of the Port of Umatilla total water right. No water would be discharged into the Columbia River as part of project operation. The potential impacts of water withdrawal (up to 62 cfs) on Columbia River federally listed salmon species for the Port of Umatilla's water supply were analyzed in a Biological Assessment (CH2M Hill 1993). Since the proposed water volume for the Wanapa Project is within the Port's water volume capacity, no new water rights in the Columbia River would be required. Depletions were accounted for in previous NEPA and Section 7 analyses. As indicated in the Umatilla Generating Project EIS (BPA 2001), the Port of

Umatilla withdrawal volume represents an extremely small portion of Columbia River base flows (less than 0.005 percent of low flow conditions).

The intake system would follow the NMFS criteria for minimizing impingement and entrainment impacts on Columbia River salmon species. The maximum approach velocity of water would be 0.4 cfs and the intake screen would consist of 0.125-inch openings. No new construction would be required for the intake area. In summary, water withdrawal from the Columbia River for this project would not be likely to adversely affect federally listed salmon species and the bull trout and their critical habitat.

Plant Discharge Water to Cold Springs Reservoir

The discharge of cooling water would contribute approximately 2.4 cfs (average) or 3.4 cfs (maximum) to Cold Springs Reservoir via the Feed Canal. The addition of water to the reservoir would be a beneficial impact to aquatic habitat for fish species and wildlife such as waterfowl and shorebirds.

3.4.2.3 Wildlife

Potential impacts to terrestrial wildlife species from the Proposed Action can be classified as short term and long term. Short-term impacts consist of habitat removal and activities associated with project construction. Long-term impacts would consist of changes to wildlife habitat. The severity of both short- and long-term impacts would depend on factors such as the sensitivity of the species impacted, seasonal use patterns, type and timing of project activities, and physical parameters (e.g., topography, cover, forage, climate). Direct impacts to wildlife species would include limited direct mortalities from project construction and operation, habitat loss or alteration, incremental habitat fragmentation, and animal displacement. Indirect impacts would include increased noise, additional human presence, and the potential for increased vehicle-related mortalities.

Potential impacts to wildlife species from the Proposed Action would result from the conversion of approximately 47 acres of shrub-steppe habitat to industrial use from the construction of the electric power generation facility. Clearing and grading would alter 71 acres of a native habitat (i.e., grassland and shrub-steppe) from the construction of supplemental wastewater and gas pipelines, transmission lines, and other ancillary facilities (i.e., water intake pipeline and access roads).

Wildlife habitat is low quality in areas that were burned north of U.S. Highway 730. ODFW classifications for the grassland-steppe and shrub-steppe habitat south of U.S. Highway 730 and the other habitat types are Category 4, which are important but not essential habitats for wildlife.

Game Species

Direct impacts to mule deer would include the incremental loss of potential forage (native vegetation and previously disturbed vegetation) and would result in an incremental increase in habitat fragmentation within the proposed surface disturbance areas. However, these incremental losses of vegetation would represent a small percentage (less than 1 percent) of the overall available habitat within the project region. The loss of available vegetation would be long term (greater than 20 years). However, herbaceous species may become established within 3 to 5 years, depending on reclamation success, coupled with future weather conditions. However, in most instances, suitable habitat adjacent to the disturbed areas would be available for this species until grasses and woody vegetation were reestablished within the disturbance areas.

Indirect impacts would result from increased noise levels and human presence during surface disturbance activities. Disturbance would be greatest during the construction period due to presence of heavy equipment, traffic, and increased human activity. The duration of construction-related noise and human activity would vary depending upon the project component and type of activity. Overall, noise disturbance from construction activities would be short-term (approximately 3 months each for the transmission line and gas/water discharge pipelines and approximately 26 months for the power plant). Mule deer would likely decrease their use within areas during surface disturbance activities. However, this displacement would be short-term and animals would return to the project area following construction activities.

Potential impacts to small game from the Proposed Action would result in the incremental loss of habitat and increased habitat fragmentation until vegetation became reestablished. Potential direct impacts to small game species could include nest or burrow abandonment or loss of eggs or young. Indirect impacts could include the temporary displacement of small game from the disturbance areas as a result of increased noise and human presence. Displacement of small game animals from disturbance areas would be short-term and animals would return to the disturbance areas following construction activities.

Noise-related disturbances from power plant operation could potentially result in long-term impacts to game species. However, the total extent of habitat lost as a result of wildlife avoidance response is impossible to predict since the degree this response varies from species to species and even varies between different individuals of the same species. Also, after initial avoidance from human activity and noise producing areas, certain wildlife species may acclimate to the activity and begin to reoccupy areas formerly avoided. For example, during the first few years of the power plant operation, it is likely that deer would be displaced from a larger area than the actual disturbance area at the power plant site due to avoidance response. However, deer have demonstrated the ability to acclimate to a variety of human development activities (e.g., mining) as long as human harassment levels do not increase substantially. It is possible, therefore, that the extent of deer displacement would approximate the actual disturbance area after the first few years of the power plant's operation. This response also may be similar to other game species that inhabit the project area.

Non-game Species

Direct impacts to non-game species from surface disturbance activities would result in the incremental long-term loss of habitat and increased fragmentation until vegetation became reestablished. Potential impacts also would result in mortalities of less mobile or burrowing non-game species (e.g., small mammals, birds, reptiles, amphibians, invertebrates) as a result of crushing from vehicles and equipment. Other impacts would include the short-term displacement of some of the more mobile species (e.g., medium-sized mammals, adult birds) as a result of increased noise levels and human presence during surface disturbance activities. Although the habitats adjacent to the proposed disturbance area may support some displaced animals, species that are at or near carrying capacity could suffer some increased mortalities.

If surface disturbance activities were to occur during the breeding season for passerines (approximately March 1 through June 30), impacts would result in nest or territory abandonment or the loss of eggs or young, resulting in the loss of productivity for the breeding season. However, impacts to nesting birds would depend on the nest location relative to the proposed disturbance area, the phase of the breeding period, and the level and duration of the disturbance.

Raptor surveys were conducted on the Wanaket Wildlife Area and the adjacent mainstem of the Columbia River on June 8 and 9, 2004. A total of three active nests and two inactive nests were recorded in the wildlife area. Of the three active nest sites, two nests in the western portion of the

wildlife area were occupied by red-tailed hawks and one nest site north of the Two Rivers Correctional Institution was occupied by osprey (Quaempts 2004).

Direct impacts to nesting raptors that are located within or adjacent to the project area, would include abandonment of a breeding territory or nest site or the potential loss of eggs or young as a result of surface disturbance activities (e.g., ground disturbance, noise, human presence). These losses, if they were to occur, would reduce productivity for that breeding season. However, the degree of these potential impacts would depend on a number of variables including the location of the nest site, the species' relative sensitivity, breeding phenology, and possible topographic shielding. Potential impacts to nesting raptors from construction activities could be minimized through related mitigation measures identified below. Noise-related disturbances from power plant operation would be the same as discussed above for game species.

The new 4.4-mile, 500-kV electrical transmission line segment would incrementally increase the collision potential for migrating and foraging bird species (e.g., raptors, ducks, passerines [Avian Power Line Interaction Committee (APLIC) 1994]). However, collision potential typically depends on variables such as the line location in relation to high-use habitat area (e.g., nesting, foraging, and roosting), line orientation to flight patterns and movement corridors, species composition, visibility, and line design. The Proposed Action transmission route crosses four wetlands in the Wanaket Wildlife Area. The route segment located within the Wanaket Wildlife Area also is located within flyways for waterfowl that utilize numerous other wetlands on either side of the route. The types of birds most likely to collide with the transmission lines are waterfowl such as ducks and geese, great blue herons, and birds that form tight flocks such as blackbirds (Parsons Brinckerhoff Quade & Douglas 2002). Potential impacts to bird species from potential collision could be reduced through related mitigation measures identified below.

While electrical power lines can pose a potential electrocution hazard for birds, such as raptors, configurations less than 1 kV or greater than 69 kV typically do not present an electrocution hazard, based on conductor placement and orientation (APLIC 1996). Consequently, no electrocution impacts would be anticipated from the operation of the proposed 500-kV transmission line.

Recommended Mitigation Measures. The following measures are proposed to reduce potential impacts to wildlife from pipeline construction.

W-1: Prior to construction activities during the raptor breeding season (March 1 - June 30), breeding raptor surveys would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any potentially active nest sites within 0.5 mile from the project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas would be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures *would* be implemented on a site-specific and species-specific basis, in coordination with CTUIR/Wanaket Wildlife Area biologists.

W-2: Standard, safe designs as outlined in Mitigating Bird Collision with Power Lines (APLIC 1994) would be incorporated in the design of the electrical distribution lines to prevent collision to foraging and migrating bird species with the project area, in coordination with CTUIR and Wanaket Wildlife Area biologists. Design features would include the configuration of the route to avoid partitioning foraging and resting habitat, alignment of overhead groundwire to the same height as the conductors, and the use of markers to increase the visibility of the lines to birds.

3.4.2.4 Special Status Wildlife Species

The impact analysis for special status wildlife resources focused on those species that were identified as potentially occurring within the project area (see Appendix A, **Table A-1**). Consequently, project-related impacts for 13 special status species are discussed below.

Federal Species

Bald Eagle. No direct or indirect impacts to breeding or roosting bald eagles would be anticipated from project construction. No historic or active communal roost sites, winter roosts, winter concentration areas have been identified within the project area. The nearest historic bald eagle winter roost area occurs approximately 2 miles east of the plant site at Hat Rock State Park. However, individual bald eagles have been observed annually at the Wanaket Wildlife Area during the winter (Quaempts 2003). Consequently, eagles could occasionally forage on the Wanaket Wildlife Area. Impacts to foraging eagles from project development and operation would include alternation (removal of the shrub component) from approximately 71 acres of potential foraging habitat (i.e., grassland, shrub-steppe, and wetland habitats) from the construction of water supply, wastewater, and gas pipelines, electrical transmission lines, and ancillary facilities until reclamation is completed and vegetation is reestablished. Approximately 47 acres of potential foraging habitat would be removed by the construction of the power plant facility. Other impacts

could also include the short-term displacement of this species as a result of increased noise levels and human presence during surface disturbance activities and operation of the power plant facility. However, based on the distance of known roost sites from the project area, marginal foraging habitat at the proposed power plant site, and amount and foraging habitat within the project region, potential impacts to the bald eagle from the project would be low.

State-Sensitive Species

Sensitive species that occur primarily in grassland and shrub-steppe habitats within the project area include long-billed curlew, grasshopper sparrow, loggerhead shrike, and western burrowing owl. Sensitive raptor species that were identified for the project area include ferruginous hawk, Swainson's hawk, and American peregrine falcon. Impacts to these species would result in the incremental long-term alteration of approximately 71 acres of habitat from the construction of water and gas pipelines, electrical transmission lines, and ancillary facilities until reclamation is completed and vegetation is reestablished. Approximately 47 acres of habitat would be removed by the construction of the power plant facility. Impacts also could include the short-term displacement of these species as a result of increased noise levels and human presence during surface disturbance activities and operation of the plant facility. If surface disturbance activities were to occur during the breeding season for these birds (approximately March 1 through June 30), impacts could result in nest or territory abandonment or the loss of eggs or young, resulting in the loss of productivity for the breeding season. Two known burrowing owl nests occur along the proposed water and gas pipeline route on the Wanaket Wildlife Area. Potential impacts to these species from construction activities could be minimized through related mitigation measures identified below.

The American white pelican occurs primarily within wetland habitats within the project area. Impacts to this species would result from the temporary disturbance of approximately 2.6 acres of potentially suitable foraging wetland habitat during transmission line construction. Impacts also could include the short-term displacement of these species as a result of increased noise levels and human presence during surface disturbance activities and operation of the power plant facility. However, occurrence by this species would be limited to migrating and foraging individuals moving through the project area. Consequently, impacts to this species from construction and operation of the project would be low.

Sensitive species that occur primarily in or near wetland and riparian habitats within the project area include western painted turtle, western toad, Woodhouse's toad, and northern leopard frog.

Impacts to these species would result from the temporary disturbance of approximately 2.6 acres of potentially suitable habitat for these species during transmission line construction.

Recommended Mitigation Measures. Mitigation measures that would be applicable for special status raptor species would include W-1. Additional mitigation measures that would minimize potential impacts to special status species as a result of project construction include:

W-3: Prior to construction activities during the avian breeding season (March 1 - June 30), avian breeding surveys for long-billed curlew, grasshopper sparrow, loggerhead shrike, and western burrowing owl would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any potentially active nest sites within 0.25 mile from the project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas would be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures would be implemented on a site-specific and species-specific basis, in coordination with CTUIR Wanaket Wildlife Area biologists.

W-4: Prior to construction activities through suitable breeding habitat for special status reptile and amphibian species, occurrence surveys for western painted turtle, western toad, Woodhouse's toad, and northern leopard frog would be conducted by a qualified biologist to determine presence. If present, appropriate protection measures could include rerouting the pipeline ROW to avoid breeding habitat, in coordination with CTUIR and Wanaket Wildlife Area biologists.

3.4.3 *Proposed Action Impact Summary*

3.4.3.1 *Vegetation*

Project construction would result in vegetation disturbance to 47 acres at the plant site, 9 acres within access road ROW, **128** acres within the gas supply/***plant discharge water*** ROW, and 101 acres within the electric transmission line ROW. The majority of the disturbance would be to grassland-steppe, shrub-steppe, and irrigated cropland. Vegetation removal would be permanent at the plant site. By implementing reclamation procedures, grassland and irrigated crop species would return by the next growing season. Recovery of shrub species would take an estimated 25 to 50 years. Impacts to wetlands would be eliminated by avoiding one wetland proposed to be crossed by the gas/water discharge pipeline and implementing drainage control measures within the

pipeline ROW. Noxious weed control measures would be required to minimize the introduction and spread of noxious weed species in the disturbance areas.

Project operation would deposit vapor and droplets on vegetation such as grasses, weedy, and wetland species within an approximate 0.25-mile radius around the power plant. By assuming effect-levels would be similar to studies with crop species, cooling tower drift would not be expected to affect vegetation in the fallout area.

3.4.3.2 Fisheries

Project construction would result in localized surface disturbance near wetlands, drainage canals, or intermittent drainages. These water bodies support invertebrate species *but* no fish. By implementing erosion control measures, sediment input to surface water resources would be minor. Therefore, impacts to aquatic habitat would be minor.

Project water use and discharge were evaluated for fisheries in the Columbia River, Cold Springs Reservoir, and the Umatilla River. Water withdrawal from the Columbia River would occur under an existing water right (*Permit No. 49497*). The impacts to fish species (including listed salmon, steelhead, and bull trout) in the Columbia River were accounted for in previous NEPA and Section 7 analyses (CH2M Hill 1993). Water discharge to Cold Springs Reservoir would provide a beneficial impact to fish and aquatic habitat in Cold Springs Reservoir by providing additional water. No direct impacts to the Umatilla River would be anticipated.

3.4.3.3 Wildlife

Power plant construction would permanently remove 47 acres of natural wildlife habitat. Construction of ancillary facilities would alter (remove the shrub-component) on approximately 71 acres over the long-term (25 to 50 years). However, habitat quality within the project study area would be considered low, based on recent fires on the Wanaket Wildlife Area, the amount of existing habitat fragmentation from agricultural residential, and industrial activities in the study area, and the establishment of nonnative weed species to the area. Other impacts would include an incremental increase in habitat fragmentation; limited mortality of small, less mobile species; and temporary displacement of wildlife from the construction area as a result of increased noise and human presence.

3.4.3.4 Special Status Species

Project surface disturbance activities would permanently remove 47 acres, and remove the shrub component from **81** acres of shrub-steppe habitat that represents potentially suitable foraging habitat for the bald eagle, ferruginous hawk, Swainson's hawk, and American peregrine falcon. These same activities would reduce the potential foraging and nesting habitat for the long-billed curlew, grasshopper sparrow, loggerhead shrike, and western burrowing owl. The western burrowing owl is known to have historically nested in the vicinity of the plant site. Transmission line construction could temporarily disturb 2.6 acres of potentially suitable wetland habitat for American white pelican, western painted turtle, western toad, Woodhouse's toad, and northern leopard frog. Other impacts could include the short-term displacement of these species from the project area as a result of increased noise levels and human presence during surface disturbance activities and operation of the power plant facility. However, impacts to these species from project construction and operation would be low, based on the known distribution of these species within the project area, available remaining habitat on adjacent areas, low overall habitat quality within the project area, and mitigation measures that have been developed for these species.

3.4.4 Component Alternatives Impact Summaries

Comparisons of the relative wildlife and special status species impacts of No Action, Proposed Action, and constructing and operating project component alternatives in different locations are presented in Table 3.4-6 (gas/plant discharge water pipelines), Table 3.4-7 (transmission lines), and Table 3.4-8 (plant discharge locations).

Table 3.4-6
Natural Gas Supply/Plant Discharge Water Pipeline Alternatives Comparison – Wildlife

| Resource/Impact Issue | Alternatives | | | | | | | |
|--|---|---|---|--|--|---|---|---|
| | No Action | Proposed Action | 1 | 2 | 3 | 4 | 5 | 6 |
| | | (Figure 2.3-1) | (Figure 2.4-1) | (Figure 2.4-2) | (Figure 4.2-3) | (Figure 2.4-4) | (Figure 2.4-5) | (Figure 2.4-6) |
| Vegetation | | | | | | | | |
| Shrub and grassland-steppe disturbance | No new surface disturbance would occur. | Approximately 24 acres of this vegetation community would temporarily be disturbed during construction. | Approximately 41 acres of this vegetation community would temporarily be disturbed during construction. | Approximately 23 acres of this vegetation community would temporarily be disturbed during construction. | Approximately 39 acres of this vegetation community would temporarily be disturbed during construction. | Approximately 30 acres of this vegetation community would temporarily be disturbed during construction. | Approximately 27 acres of this vegetation community would temporarily be disturbed during construction. | Approximately 27 acres of this vegetation community would temporarily be disturbed during construction. |
| Number of wetlands crossed | No new surface disturbance would occur | No developed wetlands within the Wanaket Wildlife Area would be crossed by the ROW. | No wetlands would be crossed by the ROW. | Seven wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. |
| Wetland area crossed | No new surface disturbance would occur | No developed wetlands within the Wanaket Wildlife Area would be crossed by the ROW. | No wetlands would be crossed by the ROW. | Approximately 1 acre would be crossed by the ROW. | No wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. | No wetlands would be crossed by the ROW. |
| Wildlife | | | | | | | | |
| Wildlife habitat | No new surface disturbance would occur | Disturbance of approximately 24 acres of potentially suitable grassland/shrub-steppe habitat, and approximately 82 acres of irrigated cropland habitat. | No impacts to wetland habitat, disturbance of approximately 41 acres of grassland/shrub-steppe habitat, and 78 acres of irrigated cropland habitat. | Disturbance of approximately 1.2 acres of wetland habitat and approximately 25 acres of grassland/shrub-steppe foraging habitat, and 75 acres of irrigated cropland habitat. | No impacts to wetland habitat, disturbance of 39 acres of grassland/shrub-steppe foraging habitat, and 78 acres of irrigated cropland habitat. | No impacts to wetland habitat, disturbance of 30 acres of grassland/shrub-steppe habitat, and 69 acres of irrigated cropland habitat. | No impacts to wetland habitat, disturbance of 27 acres of grassland/shrub-steppe habitat, and 50 acres of irrigated cropland habitat. | No impacts to wetland habitat, disturbance of 27 acres of grassland/shrub-steppe habitat, and 50 acres of irrigated cropland habitat. |

Table 3.4-6 (Continued)

| Resource/Impact Issue | Alternatives | | | | | | | |
|---|--|---|---|--|---|---|---|---|
| | No Action | Proposed Action | 1 | 2 | 3 | 4 | 5 | 6 |
| | | (Figure 2.3-1) | (Figure 2.4-1) | (Figure 2.4-2) | (Figure 4.2-3) | (Figure 2.4-4) | (Figure 2.4-5) | (Figure 2.4-6) |
| Wanaket Wildlife Area | No new surface disturbance would occur | Approximately 8,429 feet of land would be crossed by the ROW. | Approximately 14,640 feet of land would be crossed by the ROW. | Approximately 8,813 feet of land would be crossed by the ROW. | Approximately 11,636 feet of land would be crossed by the ROW. | Approximately 9,302 feet of land would be crossed by the ROW. | Approximately 9,229 feet of land would be crossed by the ROW. | Approximately 9,229 feet of land would be crossed |
| Special Status Species | | | | | | | | |
| Bald eagle | No new surface disturbance would occur | Disturbance of approximately 24 acres of potentially suitable grassland/shrub-steppe foraging habitat for bald eagles. However, the project area consists of marginal foraging habitat, as compared to habitats within the project region. | No impacts to wetland foraging habitat, disturbance of approximately 41 acres of grassland/shrub-steppe foraging habitat. | Disturbance of approximately 1.2 acres of wetland habitat and approximately 25 acres of grassland/shrub-steppe foraging habitat. | No impacts to wetland habitat and disturbance of approximately 39 acres of grassland/shrub-steppe foraging habitat. | No impacts to wetland habitat and disturbance of approximately 30 acres of grassland/shrub-steppe foraging habitat. | No impacts to wetland habitat and disturbance of approximately 27 acres of grassland/shrub-steppe foraging habitat. | No impacts to wetland habitat and disturbance of approximately 30 acres of grassland/shrub-steppe foraging habitat. |
| Long-billed curlew, grasshopper sparrow, loggerhead shrike, western burrowing owl | No new surface disturbance would occur | Disturbance of approximately 24 acres of potentially suitable nesting and foraging grassland/shrub-steppe habitat for long-billed curlew, grasshopper sparrow, loggerhead shrike, western burrowing owl. The PA would come within several hundred feet of two known burrowing nest sites that have been active for several years. | Disturbance of approximately 41 acres of grassland/shrub-steppe nesting and foraging habitat. | Disturbance of approximately 25 acres of grassland/shrub-steppe nesting and foraging habitat. | Disturbance of approximately 39 acres of grassland/shrub-steppe nesting and foraging habitat. | Disturbance of approximately 30 acres of grassland/shrub-steppe nesting and foraging habitat. | Disturbance of approximately 27 acres of grassland/shrub-steppe nesting and foraging habitat. | Disturbance of approximately 27 acres of grassland/shrub-steppe nesting and foraging habitat. |

Table 3.4-6 (Continued)

| Resource/Impact Issue | Alternatives | | | | | | | |
|---|--|--|--|---|--|--|--|--|
| | No Action | Proposed Action | 1 | 2 | 3 | 4 | 5 | 6 |
| | | (Figure 2.3-1) | (Figure 2.4-1) | (Figure 2.4-2) | (Figure 4.2-3) | (Figure 2.4-4) | (Figure 2.4-5) | (Figure 2.4-6) |
| Ferruginous hawk, Swainson's hawk, and American peregrine falcon | No new surface disturbance would occur | Disturbance of approximately 24 acres of potentially suitable grassland/shrub-steppe habitat for ferruginous hawk, Swainson's hawk, and American peregrine falcon. | No impacts to wetland habitat and a disturbance of approximately 41 acres of grassland/shrub-steppe habitat. | Disturbance of approximately 1.2 acres of wetland habitat and approximately 25 acres of grassland/shrub-steppe habitat. | No impacts to wetland habitat and disturbance of approximately 39 acres of grassland/shrub-steppe habitat. | No impacts to wetland habitat and disturbance of approximately 30 acres of grassland/shrub-steppe habitat. | No impacts to wetland habitat and disturbance of approximately 27 acres of grassland/shrub-steppe habitat. | No impacts to wetland habitat and disturbance of approximately 27 acres of grassland/shrub-steppe habitat. |
| American white pelican | No new surface disturbance would occur | No impacts to wetland habitat. | No impacts to wetland habitat. | Disturbance of approximately 1.2 acres of wetland habitat. | No impacts to wetland habitat. | No impacts to wetland habitat. | No impacts to wetland habitat. | No impacts to wetland habitat. |
| Western painted turtle, western toad, Woodhouse's toad, and northern leopard frog | No new surface disturbance would occur | No impacts to wetland breeding habitat. | No impacts to wetland breeding habitat. | Disturbance of approximately 1.2 acres of wetland breeding habitat. | No impacts to wetland breeding habitat. | No impacts to wetland breeding habitat. | No impacts to wetland habitat. | No impacts to wetland habitat. |

Table 3.4-7
Electric Transmission Line Alternatives Comparison – Wildlife

| Resource/Impact Issue | Alternatives | | | | |
|--|--------------|--|---|--|---|
| | No Action | Proposed Action (Figure 2.3-1) | 1 (Figure 2.4-7) | 2 (Figure 2.4-8) | 3 (Figure 2.4-10) |
| Vegetation | | | | | |
| Shrub and grassland-steppe disturbance | No impact | Approximately 41 acres of disturbance to this vegetation community during construction. | Approximately 58 acres of disturbance to this vegetation community during construction. | Approximately 16 acres of disturbance to this vegetation community during construction. | Approximately 28 acres of disturbance to this vegetation community during construction. |
| Wetland area potential disturbance | No impact | Approximately 2.5 acres of potential disturbance to wetlands. | Approximately 1 acre potential disturbance to wetlands. | No potential disturbance to wetlands. | No potential disturbance to wetlands. |
| Wildlife | | | | | |
| Wildlife habitat | No impact | This action would result in the incremental increase in habitat fragmentation by crossing approximately 3.9 miles of potentially suitable wildlife habitat (wetland, grassland/shrub-steppe and irrigated cropland). | This alternative would result in habitat fragmentation of approximately 4.9 miles. | This alternative would result in habitat fragmentation of approximately 0.9 mile. | This alternative would result in habitat fragmentation of approximately 1.9 miles. |
| Wanaket Wildlife Area | No impact | Approximately 6,069 feet would be crossed by the ROW. | Approximately 11,915 feet would be crossed by the ROW. | Wanaket Wildlife Area would not be crossed by the ROW. | Wanaket Wildlife Area would not be crossed by the ROW. |
| Collision potential for waterfowl | No impact | This alignment crosses a portion of the 1.5 square mile wetland complex. Approximately 15% of the total wetland complex (waterfowl resting habitat) would be partitioned from agricultural fields to the south and east (waterfowl foraging habitat). Waterfowl using the isolated portion of the wetland would need to negotiate the transmission power line as they flew from one habitat type to the other. | This alignment would separate about 70% of the total wetland complex from the agricultural area. | This alignment would not separate the wetland complex from the agricultural areas. | This alignment would not separate the wetland complex from the agricultural areas. |
| | No impact | The alignment does not parallel the river and is offset from the river. As a result, waterfowl could use the river as a flight corridor and, for those birds crossing the river, the setback would allow waterfowl ample opportunity to adjust their flight paths and avoid the power lines. | Like the Proposed Action, the alignment would not parallel the river and is offset from the river. As a result, waterfowl could use the river as a flight corridor and, for those birds crossing the river, the setback would allow waterfowl ample opportunity to adjust their flight paths and avoid the power lines. | This alignment would parallel the river, though approximately 50% of the alignment would be about 0.5 mile from the river. This alignment would pose a potential collision hazard to waterfowl utilizing the river as a flight corridor as well as those birds crossing the river. | This alignment would parallel the river. The majority of the alignment would be within 0.2 mile from the river. This alignment would pose a potential collision hazard to waterfowl utilizing the river as a flight corridor as well as those birds crossing the river. |

Table 3.4-7 (Continued)

| Resource/Impact Issue | Alternatives | | | | |
|---|--------------|--|---|---|---|
| | No Action | Proposed Action | 1 | 2 | 3 |
| Special Status Species | | | | | |
| Bald eagle | No impact | Temporary disturbance of approximately 2.5 acres of potentially suitable wetland habitat and approximately 41 acres of potentially suitable grassland/shrub-steppe habitat for foraging bald eagles. However, the project area consists of marginal foraging habitat, as compared to habitats within the project region. | Temporary disturbance of approximately 1 acre of wetland foraging habitat and approximately 58 acres of grassland/shrub-steppe foraging habitat. | No impacts to wetland habitat and disturbance of approximately 16 acres of grassland/shrub-steppe foraging habitat. | No impacts to wetland habitat and disturbance of approximately 28 acres of grassland/shrub-steppe foraging habitat. |
| Long-billed curlew, grasshopper sparrow, loggerhead shrike, western burrowing owl | No impact | Disturbance of approximately 41 acres of potentially suitable nesting and foraging habitat for long-billed curlew, grasshopper sparrow, loggerhead shrike, and western burrowing owl. | Disturbance of approximately 58 acres of grassland/ shrub-steppe nesting and foraging habitat. | Disturbance of approximately 16 acres of grassland/shrub-steppe nesting and foraging habitat. | Disturbance of approximately 28 acres of grassland/shrub-steppe nesting and foraging habitat. |
| Ferruginous hawk, Swainson's hawk, and American peregrine falcon | No impact | Temporary disturbance of approximately 2.5 acres of potentially suitable wetland habitat and approximately 41 acres of potentially suitable grassland/shrub-steppe habitat for ferruginous hawk, Swainson's hawk, and American peregrine falcon. | Temporary disturbance of approximately 1 acre of wetland habitat and approximately 58 acres of grassland/shrub-steppe nesting and foraging habitat. | No impacts to wetland habitat and disturbance of approximately 16 acres of grassland/shrub-steppe habitat. | No impacts to wetland habitat and disturbance of approximately 28 acres of grassland/shrub-steppe habitat. |
| American white pelican | No impact | Temporary disturbance of approximately 2.5 acres of potentially suitable wetland habitat for the American white pelican. | Temporary disturbance of approximately 1 acre of wetland habitat. | No impacts to wetland habitat. | No impacts to wetland habitat. |
| Western painted turtle, western toad, Woodhouse's toad, and northern leopard frog | No impact | Temporary disturbance of approximately 2.5 acres of potentially suitable wetland breeding habitat for the Western painted turtle, western toad, Woodhouse's toad, and northern leopard frog. | Temporary disturbance of approximately 1 acre of wetland breeding habitat. | No impacts to wetland breeding habitat. | No impacts to wetland breeding habitat. |

Table 3.4-8
Plant Discharge Location Alternatives Comparisons – Wildlife and Special Status Species

| | No Action | Proposed Action | Alternative 1 |
|-----------------------|--|--|--|
| | | (Figure 2.3-1) | (Figure 2.4-11) |
| Resource/Impact Issue | | | |
| Vegetation/Land Cover | No new native vegetation community disturbance would occur. | Approximately 2 acres of shrub steppe vegetation would be removed during plant discharge water pipeline construction between the natural gas supply pipeline ROW and Cold Springs Reservoir, resulting in a long-term conversion of this shrub community to a grassland/weedy annual dominated community. | Approximately 5 acres of shrub steppe vegetation would be removed during construction, resulting in a long-term conversion of this shrub community to a grassland/weedy annual dominated community. |
| Wetlands | No new wetlands disturbance would occur. | The pipelines would avoid the Wanaket Wildlife Area created wetlands, but would cross an area that could be developed as wetlands in the future. Trenching across basalt rock could modify the surface drainage feeding wetlands, which could be partially mitigated with trench plugs. | The pipelines would avoid the Wanaket Wildlife Area created wetlands, as well as areas that could be developed as wetlands in the future. Trenching across basalt rock could modify the surface drainage, which could be partially mitigated with trench plugs. |
| Aquatic Species | No new water withdrawals or discharges would occur in the Columbia River or tributaries, and therefore no effects on fish habitats and populations would occur. | Proposed water withdrawal rates from Lake Wallula on the Columbia River represent a very small fraction of the Columbia River flow rate even at very low river flows (see Water Resources above). The proposed withdrawal would occur under an existing water right that was considered in prior USFWS consultations with the USCOE regarding construction of new intake structures at the Port of Umatilla. | Proposed water withdrawal rates from Lake Wallula on the Columbia River represent a very small fraction of the Columbia River flow rate even at very low river flows (see Water Resources above). The proposed withdrawal would occur under an existing water right that was considered in prior USFWS consultations with the USCOE regarding construction of new intake structures at the Port of Umatilla. As described under Water Resources above, about 20 percent of the power plant makeup water would be returned to the Columbia River near the same location it was withdrawn. The remainder of the water would be evaporated in the power plant cooling system. |
| Wildlife | No native shrublands would be removed or modified by project construction disturbance within the Wanaket Wildlife Management or the Cold Springs National Wildlife Refuge. Existing habitat improvement programs would continue in both areas. | Approximately 2 acres of shrub steppe vegetation would be removed during construction of the plant discharge water pipeline between the natural gas supply pipeline and Cold Springs Reservoir, resulting in a long-term reduction in habitat carrying capacity for species dependent on sagebrush communities, and an increase in habitat carrying capacity for species adapted to grasslands and disturbed weedy habitats. The route would cross 0.3 mile of the Cold Springs National Wildlife Refuge. The remainder of the surface disturbance for the plant discharge water pipeline is included in the ROW for the gas supply pipeline, which is the same for both alternatives. | Approximately 5 acres of shrub steppe vegetation would be removed during construction, resulting in a long-term reduction in habitat carrying capacity for species dependent on sagebrush communities, and an increase in habitat carrying capacity for species adapted to grasslands and disturbed weedy habitats. The pipeline route would cross approximately 0.2 mile of Oregon Fish and Wildlife lands located along the south bank of the Columbia River. |

Table 3.4-8 (Continued)

| | No Action | Proposed Action | Alternative 1 |
|------------------------|--|---|--|
| | | (Figure 2.3-1) | (Figure 2.4-11) |
| Resource/Impact Issue | | | |
| Special Status Species | No new native vegetation community or wetland disturbance would occur that would affect species dependent on these habitats. No new water withdrawals or discharges would occur in the Columbia River or tributaries, and therefore no effects on fish habitats and populations would occur. | Approximately 2 acres of bald eagle foraging habitat (consisting of native shrub-steppe) would be removed from construction of the plant discharge water pipeline segment from the gas supply pipeline/Feed Canal intersection to Cold Springs Reservoir, a small fraction of available foraging habitat near the Columbia River. No bald eagle roost or nesting trees would be affected. Approximately 2 acres of shrub-steppe and grassland foraging and nesting habitat would be removed for the long term for raptors (ferruginous hawk, Swainson's hawk, American peregrine falcon), and other birds (long-billed curlew, grasshopper sparrow, loggerhead shrike, western burrowing owl). The remainder of the surface disturbance for the plant discharge water pipeline is included in the ROW for the gas supply pipeline, which is the same for both alternatives. | Approximately 5 acres of bald eagle foraging habitat (consisting of native shrub-steppe) would be removed by pipeline construction of a plant discharge water pipeline between the plant site and the Columbia River, a small fraction of available foraging habitat near the Columbia River. No bald eagle roost or nesting trees would be affected. The proposed plant discharge water pipeline construction would remove approximately 5 acres of shrub-steppe, grassland and disturbed area foraging and nesting habitat would be removed for the long term for raptors (ferruginous hawk, Swainson's hawk, American peregrine falcon), and other birds (long-billed curlew, grasshopper sparrow, loggerhead shrike, western burrowing owl). |

3.5 Air Resources

The proposed power plant would be a major source of air emissions and require a construction permit under the federally mandated PSD regulations. Since the source would be located on land governed by the Confederated Tribes of the Umatilla Indian Reservation, the PSD permit must be submitted to and approved by the regional office of the USEPA (Region X) in Seattle, Washington.

The PSD application requires analysis of best available control technologies (**BACT**) and an assessment of impacts of the plant's maximum emissions on the federal ambient air quality standards (Title 40 of the CFR, paragraph 52.21 [40 CFR 52.21]). That application has been submitted to Region X of the USEPA, and it demonstrates that the proposed facility **would** employ the BACT for all air pollutants and **would** not cause or contribute to any exceedences of all applicable ambient air quality standards. The facility also **would** be required to install monitoring equipment and maintain operations to ensure that it **would** comply with emission limits established in the PSD permit.

The proposed power plant site is located in an area that is currently designated as "attainment" for all state and national ambient air quality standards. Meeting these standards indicates that the air quality of the area with the proposed Wanapa Energy Center **would** meet or exceed all ambient air quality standards set to protect human health, plant and vegetation health, and **would** allow for future growth of farming and industrial activities in the area. The air quality analysis included within the completed PSD application demonstrates that:

- The proposed facility **would** not significantly deteriorate the quality of the air surrounding the proposed site;
- The emissions from the proposed operation (when added to the natural background levels of pollutants, existing farming and industrial activities, existing mobile sources of emissions, and recently permitted industrial sources) would not cause or contribute to ambient pollution levels that exceed the ambient air quality standards;
- The facility **would** employ BACT that meets or exceeds all recently permitted sources of electrical power in the northwest; and

-
- The facility **would** not lead to deterioration of air quality in nearby pristine areas, such as the Columbia River Gorge, Mount Hood, Mount Adams, Eagle Cap, Goat Rocks, and the Strawberry Mountains.

Under the federal regulations these demonstrations are required for all pollutants for which the source is major. The PSD permit application first identifies the major emissions, the emission units, the control technologies, the emission rates (both short-term and annual average emissions), and a dispersion modeling analysis that compares facility impacts to the applicable standards. After the application has been reviewed and public comments allowed and incorporated, the Region X office **would** issue a PSD permit to construct the facility in accord with the accepted application. Any changes to the facility design or operation that affect emissions or impacts would need to be addressed in a revision or update to the PSD permit, depending on the expected change in emissions or impacts. The permitting process itself is designed to ensure that the air quality impacts from this project are acceptable and are minimized to the extent that is reasonably possible.

It should again be noted that the construction and operation of the Wanapa Energy Center **would** not impact existing industrial or farming activities and **would**, in fact, allow room for future growth and development of farming and industrial activities near the proposed site. Moreover, the proposed Wanapa Energy Center is a dramatic improvement over existing methods of electric generation, such as the nearby Boardman Coal Electric Generation Facility as seen below in **Table 3.5-1**.

Table 3.5-1
Comparison of Annual Emissions per Megawatt (MW) of Electricity Produced

| Pollutant | Wanapa Energy Center Emissions (tons/MW)¹ | Boardman Coal Facility Emissions (tons/MW)² | Improvement |
|----------------------------|---|---|--------------------|
| Sulfur Oxides | 60.1 | 101,500.0 | 99.9% |
| Nitrogen Dioxide | 318.2 | 42,290.0 | 99.2% |
| Particulate Matter | 542.8 | 3,520.0 | 90.3% |
| Carbon Monoxide | 146.4 | 2,556.7 | 94.3% |
| Volatile Organic Compounds | 133.5 | 306.7 | 56.5% |

¹Based on a plant-wide electric generation capacity of 1,485 MW.

²Based on a plant-wide electric generation capacity of 600 MW.

3.5.1 *Affected Environment*

Northeastern Oregon has a dry continental climate, typical of locations in the intermountain western U.S. The location has generally low relative humidity, but has distinct seasonal changes in meteorological conditions.

3.5.1.1 **Climate**

Daily temperatures in January average slightly above freezing, with a wide daily range of temperatures. Temperatures are seldom below 0°F. July temperatures average around 74°F, and a typical summer has only a few days with temperatures above 100°F. The area is very dry with annual average precipitation of slightly more than 23 centimeters (9 inches). Conditions are generally dry in the summer, and most of the precipitation occurs during the winter months (November, December, January, and February). Summertime thunderstorms can occasionally produce intense, short-period rainfall that lead to localized flash flooding on rare occasions. On an annual average a total of 7.8 inches of snowfall occurs in the area, largely during the winter months. Occasionally, (5 years out of a 20-year record) the area will have no snowfall during an entire winter season; however, the area has seen rare heavy snowfall, up to about 25 inches in 1 month (January 1950).

Table 3.5-2 provides a listing of monthly mean and maximum temperatures as well as average precipitation for the Umatilla site.

Wind patterns are most important for assessing impacts of emissions. The region near the Columbia River shows a bimodal distribution of wind direction, with winds “channeled” roughly parallel to the east-west direction of the Columbia River Valley itself. With the prevailing direction of an eastward movement of storms in the area, there is a clear west-southwesterly wind component, and the easterly winds are driven largely by the colder air flow down the river valley at night. Occasional strong storms in the area show a preference for the strongest winds from the west, with the passage of low pressure systems and associated cold fronts, but strong winds can occur from any direction, particularly those related to summertime showers and thunderstorms.

Table 3.5-2
Temperature and Precipitation Data for Umatilla, Oregon¹

| Month | Temperature (°F) | | | | | Mean Precipitation (in.) | |
|--------|------------------|------------|-----------|---------|--------|--------------------------|----------|
| | Avg. Max. | Daily Avg. | Avg. Min. | Highest | Lowest | Total | Snowfall |
| Jan | 39.2 | 31.4 | 23.6 | 65 | -22 | 1.20 | 4.7 |
| Feb | 48.1 | 38.5 | 28.9 | 68 | -23 | 0.90 | 1.4 |
| Mar | 56.4 | 44.2 | 32.1 | 80 | 10 | 0.82 | 0.1 |
| Apr | 67.0 | 53.2 | 39.4 | 88 | 22 | 0.54 | 0.0 |
| May | 74.8 | 60.8 | 47.0 | 98 | 26 | 0.79 | 0.0 |
| Jun | 82.1 | 67.7 | 53.4 | 108 | 38 | 0.77 | 0.0 |
| Jul | 90.3 | 74.3 | 58.3 | 110 | 36 | 0.26 | 0.0 |
| Aug | 88.0 | 72.5 | 57.0 | 114 | 42 | 0.27 | 0.0 |
| Sep | 80.6 | 64.5 | 48.2 | 101 | 31 | 0.35 | 0.0 |
| Oct | 66.2 | 52.4 | 39.0 | 87 | 19 | 0.82 | 0.0 |
| Nov | 50.7 | 41.3 | 31.7 | 77 | -6 | 1.03 | 0.2 |
| Dec | 42.7 | 35.7 | 28.6 | 67 | -7 | 1.40 | 1.3 |
| Annual | 65.5 | 53.0 | 40.6 | 114 | -23 | 9.15 | 7.8 |

¹Source: General Climate Summary, Umatilla, Oregon 1948-1965 (www.dri.edu).

3.5.1.2 Air Quality

Local Air Quality

The air quality in the area is determined by ambient ground-level concentrations of specific pollutants. The air quality regulatory program in the U.S. (as well as within individual states and air pollution control regions) has defined acceptable standards for ambient air quality. These standards protect human health and the health of plants and vegetation. Air quality conditions are determined either through direct measurements with approved instrumentation or by indirectly modeling air quality impacts from the major sources or source groups in an area.

Monitoring data are available for a site approximately 12 miles west of the proposed plant location, and were collected by Portland General Electric at the Coyote Springs Plant near Boardman, Oregon. **Table 3.5-3** lists the air quality conditions at that location for nitrogen dioxide (NO₂), SO₂, and PM₁₀. Impacts of CO emissions are not considered significant (from this proposed source) and therefore ambient CO data are not presented. These data were collected in 1994-1995

and are considered representative of background ambient air quality conditions that include natural background concentrations of these pollutants and also includes area mobile traffic and farming activities. The table demonstrates that the existing background ambient air quality conditions are well below the applicable ambient air quality standards.

Table 3.5-3
Coyote Springs Plant On-site Air Quality Data and Ambient Air Quality Standards

| Pollutant | Averaging Period | Maximum Concentration (µg/m³) | Highest Second-High Concentration¹ (µg/m³) | Ambient Standards (µg/m³) |
|------------------|-------------------------|---|---|---|
| NO ₂ | Annual | 13 | -- | 100 |
| SO ₂ | Annual | 3 | -- | 80 |
| | 24-hour | 26 | 26 | 365 ¹ |
| | 3-hour | 55 | 52 | 1,300 ¹ |
| PM ₁₀ | Annual | 20 | -- | 50 |
| | 24-hour | 105 | 81 | 150 ¹ |

¹Highest Second-High Concentration, which applies to 3-hour and 24-hour standards.

The Clean Air Act of 1970 mandated that the USEPA establish ambient ceilings for certain pollutants based on the effects of those pollutant levels on public health and welfare. USEPA promulgated standards for SO₂, NO₂, CO, particulate matter (which was originally based on total suspended particulate matter, but has been replaced by PM₁₀), ozone (O₃), and lead (Pb).

Attainment Status

Section 107 of the Clean Air Act Amendments of 1990 (CAA) requires USEPA and affected regulatory agencies to evaluate attainment of the national ambient air quality standards. Areas may be designated as non-attainment, as unclassified (for areas with insufficient data, but likely attainment), and as attainment for each specific criteria pollutant (NO₂, SO₂, PM₁₀, CO, O₃, and Pb). The unclassified areas are treated as attainment areas.

The proposed power plant is located in Umatilla County, which is currently designated and treated as an area that is in attainment for all criteria air pollutants. The nearest non-attainment areas to the plant include:

- The Wallula, Washington area, for PM₁₀;
- The LaGrande, Oregon area for PM₁₀; and
- The Spokane, Washington area for CO.

Hazardous Air Pollutants

The CAA, Title III, require the evaluation of a selected list of major sources and their emissions of a specific list of hazardous air pollutants (HAPs). If a proposed facility will emit more than 10 tons/year of any one of the listed HAPs or more than 25 tons/year of the total HAP emissions, then it may be required to comply with emission limits established under the implementing regulations (40 CFR Part 63) or under the case-by-case permit review (CAA Section 112(g)). Emissions data show that the facility is a major source of HAPs, and it is expected that it *would* need to comply with the standards for combustion turbines (40 CFR 63 Subpart YYYY) when promulgated.

Site Configuration and Surrounding Terrain

The layout of the proposed facility and its relation to nearby terrain features can have an important impact on calculated ground-level concentrations. The terrain immediately around the plant site is fairly flat, with a steep drop in elevation from the edge of the facility to the McNary Dam Reservoir along the Columbia River. Higher terrain is seen along the northern edge of the Reservoir, approximately 8 kilometers (km) north and northeast of the proposed facility. The dispersion modeling analysis incorporates the terrain features, specifically the elevation of each identified receptor grid point, into the model. Since the prevailing winds are generally toward the east-northeast, and there is little increase in elevation in that direction, the topographic features are generally conducive to adequate dispersion of pollutant emissions from this source.

Buildings on the site can create wake effects, especially in strong winds, leading to increased ground-level concentrations near the plant site. If the power plant plumes are trapped into the building wakes, the result can lead to high concentrations near the fence line. The facility may employ Good Engineering Practice stack heights to minimize or eliminate the effects of building

wake effects. These building effects on dispersion are incorporated into the dispersion modeling analysis.

Land Use

The nature of land use and surface characteristics have an effect on micrometeorological dispersion characteristics near the site. These characteristics are incorporated into dispersion models to better estimate the dispersion nature of the atmosphere around the site. The sectors around the proposed Wanapa Energy Center have been characterized as water or grassland; and those parameters have been included in the dispersion model to provide an accurate depiction of impacts.

3.5.2 *Environmental Consequences and Mitigation*

The construction and operation of the proposed facility would lead to emission of air contaminants and potential impacts on ambient air quality near the plant site and in the region. These matters are addressed in the air permit application (Trinity 2003), and the results of those analyses are summarized in this section. Other sources of data are cited where appropriate. The major emissions from the facility include:

- Emissions from the combustion of natural gas in the turbines and in the duct burners;
- Emissions of particulate emissions resulting from “drift” droplets in the water vapor plume of the cooling tower;
- Production of a visible plume from the cooling tower;
- Generation of localized fog near the plant site;
- Contribution to the world-wide production of atmospheric gases that may enhance global warming; and
- Generation of emissions related to construction, including the combustion of fuel from heavy equipment and the generation of fugitive dust from soil handling and exposed areas.

3.5.2.1 Emissions and Compliance with Regulatory Standards

Emissions from the Combustion Turbines and Duct Burners

The combustion of natural gas in the turbines generates a very hot exhaust plume, which, in turn, is used to generate steam for operating a steam turbine that is tied to a generator to produce electricity. The performance of the steam turbine can be enhanced by further heating the exhaust plume with a duct burner. The steam turbine generates power from heat that would normally be lost from the turbine exhaust. This method of electric generation produces as much electricity as possible with the same amount of fuel burned since the facility *would* take advantage of the hot exhaust gases to produce additional energy in the steam turbines. This additional electricity produced in the steam turbines does not create any additional emissions to the atmosphere. The combined exhaust from the turbine and its associated duct burner are routed to a single stack. Under normal maximum load operations the exhaust plume is about 164°F (346°K) as it exits the stack. The ambient conditions (temperature especially) affect the combustion conditions in the turbine and thereby affect the constituents of the exhaust plume. The emission rates also vary with the “load” on the turbine and the use of the duct burner.

The emissions and impacts of turbine/duct burner operation are the major air quality issue related to obtaining a permit for the facility. The maximum emission rates for each of the criteria pollutants are summarized in **Table 3.5-4**. The emission rates have been demonstrated to comply with BACT requirements, other emission limits, and meet all applicable ambient standards as discussed in the following sections. The permit application included an analysis of emission rates and impacts for each of three ambient temperatures (maximum 109°F, average 52.2°F, and minimum –20°F), at loads ranging from 100 percent to 50 percent of the turbine rating, and both with and without supplemental duct firing at 100 percent load. The maximum short-term impacts were determined to occur at normal temperatures under full load with duct firing. Annual maximum emissions include all four units, at full capacity on the turbines, with duct firing for a combined level of 6,800 hours per year facility-wide. These emission rates were used in modeling the impacts from the proposed facility, because they showed the highest impact.

Table 3.5-4
Summary of Emission Rates of Criteria Air Pollutants
from Combustion Turbine/Duct Burner Sources

| Pollutant | Emission Rate (ppmvd @ 15% O₂) | Emission rate per CTG (lb/hour) | Combined Units (ton/year) |
|-------------------------------------|--|--|--------------------------------------|
| NO _x | 2.0 | 33.42 | 588.00 |
| SO ₂ | 0.5 gr/100 standard cubic feet (scf) in gas | 3.25 | 56.90 |
| PM ₁₀ | Not established | 31.04 | 548.00 |
| CO | 2.0 | 10.5 | 108.70 |
| H ₂ SO ₄ Mist | Not established | 2.49 | 43.60 |
| VOC | Not established | 17.41 | 99.15 |

Emissions of NO_x and CO are mitigated for the combustion turbine/duct burner sources, in response to the requirements of the BACT analysis. Project design includes installation of a SCR system for NO_x emissions. SCR includes: 1) ammonia injection into the exhaust gases prior to emission to the atmosphere and 2) a specially designed catalyst bed in the exhaust stream that promotes the formation of gaseous molecular nitrogen and water vapor from the ammonia and NO_x mixture. The proposed project also includes installation of a catalyst for control of carbon monoxide emissions. The air permitting process provides a thorough technical review of the emission rates and costs for installing these controls. These controls reduce emissions to levels that are as low or lower than controls that are currently applied to new identical sources across the U.S. No other cost effective control technologies would achieve similar or lower emissions.

Table 3.5-5 provides a comparison of control technologies utilized in recently permitted facilities in both Oregon and Washington. This table again demonstrates that the proposed Wanapa Energy Center *would* be controlled by control technologies that are equal to, or better than, similar, newly permitted power plants.

The proposed power plant air permit application demonstrates compliance with the full range of applicable requirements, with the proposed emission rates, as discussed below.

Table 3.5-5
Comparison of Emissions Controls of Recently Built and Proposed Power Plants

| Facility | Nitrogen Oxides Emissions and Controls | Carbon Monoxide Emissions and Controls |
|----------------------------------|--|---|
| Wanapa Energy Center | 2.0 ppm – Selective Catalytic Reduction | 2.0 ppm – Oxidation Catalyst System |
| Wallula Power Plant | 2.5 ppm – Selective Catalytic Reduction | 2.0 ppm – Oxidation Catalyst System |
| Port Westward, PGE | 2.5 ppm – Selective Catalytic Reduction | 4.9 ppm – Oxidation Catalyst System |
| Umatilla Generating | 2.5 ppm – Selective Catalytic Reduction | 6.0 ppm – Oxidation Catalyst System |
| Summit Westward, Westward Energy | 2.5 ppm – Selective Catalytic Reduction | 4.0 ppm – Oxidation Catalyst System |
| Plymouth Generating | 2.0 ppm – Selective Catalytic Reduction | 2.0 ppm – Oxidation Catalyst System |
| Fredrickson Power | 3.0 ppm – Selective Catalytic Reduction | 7.0 ppm – Oxidation Catalyst System |
| Satsop Power | 2.5 ppm – Selective Catalytic Reduction | 2.0 ppm – Oxidation Catalyst System |
| Sumas Energy 2 | 2.0 ppm – Selective Catalytic Reduction | 2.0 ppm – Oxidation Catalyst System |

New Source Performance Standards

The USEPA has promulgated a set of national emission standards for a selected list of major sources, under Title 40 of the CFR, Part 60 (40 CFR 60). Various subparts of that rule apply to the proposed project.

- Subpart Da (Standards of Performance for Electric Utility Steam Generating Units)

This subpart lists emission standards for particulate matter, NO₂ and SO₂, along with monitoring requirements, testing, reporting, and recordkeeping requirements. The standards apply to units with a heat input capacity greater than 250 Million British Thermal Units (MMBtu) per hour. The heat recovery steam generating units, including the duct burners, have a heat input capacity of 546.2 MMBtu/hour at the highest operating scenario. The emission

standards for Particulate Matter do not apply to gas-fired boilers. The emission standards for SO₂ are met by firing natural gas that has a maximum sulfur content of 0.5 grain per 100 dry standard cubic feet. The NO_x emission standards are 0.2 lb/MMBtu on a rolling 30-day average. Each unit at the proposed facility duct firing *would* meet this limit at about 0.064 lb/MMBtu.

The New Source Performance Standards also require monitoring for NO_x, and the facility is proposing to install a continuous emissions monitor for NO_x emissions (along with oxygen and CO₂) in accord with the regulation. Compliance testing *would* be required for NO_x and particulate matter along with opacity. Records of emissions data *would* be maintained on site for 2 years. Reports *would* include quarterly reports of excess emissions (if they occur).

- Subpart GG (Standards of Performance for Stationary Gas Turbines)

This subpart lists emission limits for SO₂ and NO_x for combustion turbines. The NO_x standard is based on a formulation in the rule, providing an emission rate based on the size of the turbine and on fuel-bound nitrogen. The calculated limit is 203 parts per million by volume, dry (ppmvd) at 15 percent oxygen, while the proposed limit is 2.0 ppmvd at 15 percent oxygen, well within the requirement. The SO₂ limit is based on a fuel sulfur content (0.8 percent by weight), and the natural gas sulfur content is about 0.003 percent sulfur by weight, based on 1 grain per 100 scf of natural gas. Again, the sulfur compliance is well within the required limits.

The facility *would* propose and plan to institute a custom fuel monitoring program, as allowed under the regulation. Fuel sulfur content data *would* be reported to USEPA Region X in accord with an accepted schedule. The continuous emission monitor for nitrogen oxides *would* meet any monitoring requirements for NO_x emissions for this source. An initial compliance test *would* be conducted as required by the regulation.

Permitting Under the PSD Program

The PSD program, as promulgated under 40 CFR 52 (paragraph 52.21) applies to the proposed project. A PSD application has been submitted in accord with those requirements. PSD review is triggered initially for the source and subsequently by pollutant, for those pollutants that are emitted

above a specified significant emission rate. The PSD process is conducted in the following sequence:

- Is the proposed facility a major source?

A new source is major if it has the potential to emit any of the regulated pollutants above the established major source threshold. The threshold is 100 tons/year for a list of source categories and 250 tons/year if the source is not listed. Since the facility includes a steam electric generation unit, which is a listed source category, the major source threshold is 100 tons/year of any (at least one) criteria pollutant. The proposed plant **would** exceed the major source threshold for NO_x, PM₁₀, and CO. Therefore the construction of the facility requires the issuance of a PSD permit from the relevant regulatory agency (USEPA, Region X).

- Is the facility in an attainment/unclassified area?

For a source that is proposing to be located in an area that is classified as attainment, or as unclassified, the PSD regulations apply. If the source were locating in an area that is non-attainment for one or more pollutants, the New Source Review requirements for non-attainment areas would apply. The proposed area is attainment or unclassified for all criteria pollutants, and therefore the PSD regulations would apply.

- What pollutants are emitted above the significant emission rate?

Significant emission rates are established for each of the criteria air pollutants, as well as for additional regulated pollutants. The significant emission rate for NO_x, SO₂, and VOCs is 40 tons/year; for CO it is 100 tons/year; for PM₁₀ it is 15 tons/year, for lead it is 0.6 ton/year. The significant emission rates are established for sulfuric acid mist, hydrogen sulfide, total reduced sulfur compounds, and others. The proposed facility **would** exceed the significant emission rate for NO_x, SO₂, CO, PM₁₀, VOCs, and sulfuric acid mist.

PSD regulations require several analyses that must be completed for the pollutants emitted above the significant emission rate. Those analyses include an air quality impact analysis, a BACT analysis, a review of background concentrations, and a summary of regulatory requirements.

Emissions from Other Sources

Besides the emissions from the Combustion Turbine and Duct Burner sources, the application included modeling of emissions from support units at the site. Chief among those sources are the individual cooling tower cells that are installed in one cooling tower to the southeast of the main combustion sources. Cooling towers dissipate heat from the heat recovery steam generating system by evaporation of cooling water into the atmosphere. This evaporation cools the cooling water droplets in the cooling tower. As the cooling tower operates it generates a small amount of “drift,” in the form of small droplets that are entrained into a plume of water vapor from each cooling tower cell. The drift is minimized by installing very efficient cooling tower drift eliminators, which for this project have a drift rate of 0.0005 percent of the total circulating cooling water.

The water vapor is not a regulated emission; however, the drift droplets *would* contain a small amount of suspended and dissolved solids (usually inert salts) that lead to the formation of particulate matter (PM₁₀) after the drift droplet is evaporated. The cooling tower drift *would*, therefore, *be* a source of PM₁₀ emissions that are regulated by the air permit. Each cell *would* represent a source of PM₁₀ emissions (no other pollutant emissions) that were included in the model. The total cooling tower emission rate *would be 2.03* pounds/hour of PM₁₀ or 8 tons/year of PM₁₀. Those emissions as well as the cooling tower “stack” parameters were included in the modeling analysis.

The application also addressed emissions of “refrigeration modules” that were attached to each unit. However, those units *would* not be installed. The modeling results included those impacts, which would generally be very small in comparison to the turbine/duct burner emissions, and would be limited to periods when the associated inlet chilling operations were being used. Modeling results have not been modified to account for this reduction in emissions, largely because the expected changes from removing those sources would be very small and would reduce ambient impacts.

Other Federal Permitting Requirements

The proposed facility *would* be reviewed for applicability under several additional federal programs. These are listed in **Table 3.5-6**, along with expected applicability of each standard or program. In some cases the standards are not finalized, or the final design or emission rates may lead to a different interpretation. The PSD permit application has identified these requirements and

Table 3.5-6
Other Federal Applicable Requirements for Air Quality

| Federal Program | Applicability |
|---|---|
| Acid Rain Program | |
| 40 CFR Parts 72 and 75 | The facility <i>would</i> be subject and <i>would</i> need to obtain an acid rain permit. The facility must obtain allowances for SO ₂ emissions and must conduct monitoring, reporting, and recordkeeping for SO ₂ and NO _x as required by the regulations. |
| Title V Operating Permit | |
| 40 CFR Part 71 | The facility emits over 100 tons/year of any criteria air pollutant, and <i>would</i> be required to obtain a Federal Operating Permit under 40 CFR 71. A complete and timely application must be submitted to USEPA Region X within 12 months of the start of operation. |
| Compliance Assurance Monitoring | |
| 40 CFR Part 64 | The facility would need to develop a compliance assurance monitoring (CAM) plan for each pollutant that: 1) has a federally enforceable limit, 2) uses a control device to achieve that limit, and 3) has a pre-control potential to emit more than the major source threshold for that permit. The facility <i>would</i> not need a CAM plan for NO _x emissions because the monitoring is required by the acid rain program, but it <i>would</i> need a CAM plan to monitor its CO emissions. |
| Risk Management Program | |
| 40 CFR Part 68 | The program requires a risk management plan for sources that store or maintain on site a quantity of a listed substance that is above the stated threshold. The only concern is the ammonia storage for the operation of the SCR. Since the facility is planning to use aqueous ammonia, with a concentration less than 19 percent by weight, this program <i>would</i> not apply. |
| National Emission Standards for Hazardous Air Pollutants | |
| 40 CFR Part 63 | A federal standard for Maximum Achievable Control Technology (MACT) <i>was promulgated on March 4, 2004</i> , for combustion turbines (Subpart YYYY). <i>In parallel with the rule promulgation, USEPA proposed delisting of gas-fired turbines from the rule. The Wanapa Energy Center would comply with the applicable requirements, if any, of this rule when it begins operation.</i> |
| CAA Section 112(g) | This case-by-case MACT standard applies to major sources of HAPs for which no applicable standard has been promulgated. <i>A final MACT standard has been issued for combustion turbines (Subpart YYYY); CAA Section 112(g) does not apply.</i> |
| Ozone Depleting Compounds | |
| 40 CFR Part 82 | The facility <i>would</i> need to comply with requirements for handling, storing, and disposing of a regulated list of ozone-depleting compounds. |

included commitments to meet the applicable requirements as the project is installed and begins operation.

3.5.2.2 Project Air Quality Effects

Construction Equipment Emissions and Fugitive Dust

During construction the activities **would** include disturbance of the land surfaces and storage of materials and soil piles on site, as well as from operation of heavy diesel fired equipment. These short-term emissions are exempt from permitting requirements on the site.

Construction emissions include exhaust from diesel engines. The total emissions from this equipment is expected to be very small in comparison to the total vehicular traffic in the region. To reduce combustion emissions, idling of construction equipment would be minimized (shut off when not operating) and engine tune-ups **would be** required for any equipment that is maintained on site for more than 60 days.

Fugitive dust would be generated by grading, excavation, and soil handling, including storage piles. Some of the dust particles would be carried off the plant site during windy and dry conditions. Since these emissions occur at ground level, and involve particles that are relatively large, the impact of these emissions **would be** felt very near the plant site. Impacts **would** rapidly decrease with distance from the site.

The following measures **would** be employed to mitigate fugitive emissions:

- During construction in dry weather, and during windy periods when site generated dust plumes are observed off site, the facility **would** water the disturbed construction areas twice daily. Haul roads that carry active traffic **would** be watered twice daily.
- Stored soil piles **would** be stabilized with water to create a crust layer that impeded emissions of fugitive dust.
- Vehicle speeds on unpaved project areas would be limited to 20 miles per hour (30 km/hour).

Plant Operations

Because the PSD review triggers this analysis, a formal series of modeling efforts were performed and included in the PSD application. Three separate impact, or modeling, analyses may be required, including:

- A “significance analysis” that evaluates only the emissions from the proposed project, and is used to determine whether the project’s impacts are “significant.” The source parameters are used, along with characterizations of building downwash, stack data, established receptors at the fenceline and around the site, and meteorological data to determine the maximum impact for each triggered pollutant. Impacts that are above the monitoring significance threshold also require collection of ambient air quality data that is representative of site conditions at the time of the permit application. A significant impact area is determined in this analysis as well, based on the maximum distance to the significant impact level (at the established receptors) plus 50 km.
- An analysis of compliance with National Ambient Air Quality Standards (NAAQS). For those impacts above the significant impact threshold, perform an analysis of impacts on NAAQS is required. This impact analysis is a cumulative dispersion modeling analysis, which includes: 1) emissions from the proposed source; 2) emissions from existing sources (including existing farming, natural, mobile, and industrial emissions); and 3) emissions from recently permitted industrial sources. The impacts are analyzed using the dispersion modeling data for comparison to ambient standards for all pollutants that have impacts above the significant impact threshold.
- An analysis of consumption of PSD increments. For those pollutants with impacts above the significant impact level, a baseline area and baseline date are determined. All major and minor sources within the significant impact area, that received permits to increase emissions since the baseline date, are included in analysis of PSD increment consumption. PSD increments exist for NO₂, SO₂, and PM₁₀. Other pollutants are not regulated by PSD increments. The modeled impacts from these sources, including the reduction in emissions from any enforceable changes to emissions since the baseline date, are then compared to the established PSD increments for both the Class II areas and Class I (pristine areas such as National Parks) areas.
- An analysis of air quality related values at Class I areas. For the nearby Class I areas, the modeling effort should address specific values such as impacts on visibility and on acid

deposition. This analysis applies to Class I areas, and is not restricted by ambient air quality impacts.

Ambient air quality impacts were analyzed for the range of applicable requirements. For the turbine and duct burner sources, the analysis selected the individual cases in which the impacts were greatest. (Occasionally, the impacts are greatest when the source is not at full operation, because the plume rise is lessened, even though the emissions also are reduced.) The regulatory guideline model, ISCST3 PRIME, was used to provide this screening analysis, and select those cases for which the maximum impacts were determined.

The full impact analyses were conducted with the regulatory guideline AERMOD-PRIME model, because model development data show that this model is superior to ISCST3 in its assessment of winds around terrain features. Five years of meteorological data (wind speed, wind direction, temperature) that were collected at the Umatilla Army Depot (1995-1999) were used in conjunction with upper air data, from the Hanford Nuclear site and from Spokane Washington, to model these impacts. The Umatilla site is less than 5 miles (8 km) from the proposed plant site, and with no intervening topography, would provide representative meteorological wind data for modeling purposes. Atmospheric stability category data were not available from the Umatilla site, and were developed from the nearby National Weather Service Station at Walla Walla, Washington.

Specific sources were modeled as separate point sources, including each of the four turbine/duct firing stacks, and each of the cooling tower cells.

Table 3.5-7 provides the results of the significant impact analysis, which would address the emissions from only the proposed plant. This table shows the maximum modeled impact, along with the significant impact threshold, and the monitoring impact threshold. The results show that the proposed facility has an insignificant impact for SO₂ and CO emissions but subsequent analyses must be conducted for NO₂ and PM₁₀. The table also shows that the impact for PM₁₀ emissions is above the monitoring impact threshold, normally requiring a monitoring program for PM₁₀. However, there are sufficient PM₁₀ ambient data in the region to provide a representative background concentration of PM₁₀ levels.

Based on these results, the impacts were analyzed for comparison to the NAAQS and PSD increments for NO₂ and for PM₁₀.

Table 3.5-7
Significant Impact Analysis

| Pollutant | Averaging Period | Maximum Modeled Concentration ($\mu\text{g}/\text{m}^3$) | Significant Impact Threshold ($\mu\text{g}/\text{m}^3$) | Significant Impact for this Pollutant? | Monitoring Impact Threshold ($\mu\text{g}/\text{m}^3$) |
|------------------|-------------------------|--|---|---|--|
| NO ₂ | Annual | 2.25 | 1 | Yes | 14 |
| SO ₂ | Annual | 0.21 | 1 | No | None |
| SO ₂ | 24-hour | 1.72 | 5 | No | 13 |
| SO ₂ | 3-hour | 6.82 | 25 | No | None |
| PM ₁₀ | Annual | 4.14 | 1 | Yes | None |
| PM ₁₀ | 24-hour | 19.23 | 5 | Yes | 10 |
| CO | 8-hour | 17.86 | 500 | No | 575 |
| CO | 1-hour | 84.55 | 2,000 | No | None |

The analysis for compliance with the NAAQS was conducted using the same meteorological data set and receptor grid that were established for the significant impact analysis. The model included emissions from existing and recently proposed nearby industrial sources, along with accepted estimates of background concentrations, which includes natural background pollutant concentrations, existing farming operations, and existing mobile sources of emissions. All known sources were included in this analysis.

The analysis for compliance with PSD increment consumption identified those sources that consume PSD increment also were conducted. The AERMOD model was used to assess impacts in the nearby Class II areas, and a separate modeling effort, using the guideline model CALPUFF, with its associated pre- and post-processing algorithms, was used to assess impacts at the specific Class I areas. Those areas are:

- Eagle Cap Wilderness Area (WA)
- Goat Rocks WA
- Mount Adams WA
- Strawberry Mountain WA
- Columbia Gorge (designated area)
- Mount Hood WA

Modeling for Class I impacts used the guidance that has been provided by the Federal Land Manager's Air Quality Workgroup for assessing impacts on PSD increments in Class I areas.

Table 3.5-8 lists the relevant NAAQS and the modeled impacts for those pollutants, along with the relevant Class II PSD increment and their modeled impacts (at the maximum impact area).

Table 3.5-8
Modeled Maximum Impacts Compared to NAAQS and Class II PSD Increments

| Pollutant | Averaging Period | NAAQS (Data in $\mu\text{g}/\text{m}^3$) | | | | Class II PSD Increments (Data in $\mu\text{g}/\text{m}^3$) | |
|------------------|------------------|--|-------------------------|--------|-------|---|---------------|
| | | Modeled ¹ | Background ² | Total | NAAQS | Modeled | PSD Increment |
| NO ₂ | Annual | 7.24 | 13 | 20.24 | 100 | 7.24 | 25 |
| PM ₁₀ | Annual | 8.86 | 20 | 28.86 | 50 | 8.86 | 17 |
| PM ₁₀ | 24-hour | 27.33 | 105 | 132.33 | 150 | 27.33 | 30 |

¹The modeled concentration includes impacts from the proposed operation of the Wanapa Energy Center, existing industrial emission sources, and proposed industrial emission sources.

²The background concentration includes emissions from existing farming activities, mobile sources, and natural pollutant concentrations.

Table 3.5-9 provides a list of maximum PSD increment analyses for NO₂ and PM₁₀ for Class I areas. The results show the greatest impact at any of the listed receptor areas. Impacts at other Class I areas, are less than these levels, and as can be easily deduced, all are below the PSD significance threshold. No additional air quality modeling of impacts at the Class I areas is required.

Table 3.5-9
Maximum Modeled Impacts at Class I Areas and PSD Increments

| Pollutant | Averaging Period | Modeled Impact ($\mu\text{g}/\text{m}^3$) | Class II Significant Impact ($\mu\text{g}/\text{m}^3$) | Allowable PSD Increment ($\mu\text{g}/\text{m}^3$) | Location of Maximum Impact |
|------------------|------------------|--|---|---|----------------------------|
| NO ₂ | Annual | 0.0005 | 0.1 | 2.5 | Columbia Gorge |
| PM ₁₀ | Annual | 0.0029 | 0.2 | 4 | Columbia Gorge |
| PM ₁₀ | 24-hour | 0.085 | 0.3 | 8 | Mount Adams |

The Class I analysis also requires an evaluation of air quality related values, to include an assessment of impacts on visibility and on soils (acid deposition) at each area.

The deposition of both nitrogen-based acidic compounds and sulfur-based acidic compounds was analyzed for each site. The sulfur deposition is much less than the nitrogen deposition rates. The maximum nitrogen deposition was determined to be 0.00025 kg/hectare-year at the Columbia Gorge. The threshold for a significant impact is 0.005 kg/hectare-year for nitrogen based acidic compounds. Impacts are well below that threshold at any receptor in any of the Class I areas.

The impacts on visibility resources at Class I areas is calculated using the estimated maximum extinction percent over a 24-hour period. If the maximum extinction is below 5 percent of a “clean” background (natural) extinction level, for all of the modeled days, the impact is determined to be insignificant. Impacts at all Class I areas were below this threshold. There were no days in any of the Class I areas that had an average change in extinction of 5 percent or more. The maximum 24-hour extinction was 2.37 percent at Mount Adams.

Startup Emissions

Operational requirements, as well as demand for electric power, may lead to the startup or shut-down of any of the turbines or any of the duct burners. The operators have the flexibility to fire any or all units, and to operate the turbines at less than full load, in order to tailor production to current demand. Pollutant emissions during startup can exceed the normal operation emission rates, due largely to the fact that control equipment has not reached its optimum operating temperature. CO is the main constituent of concern regarding startup emissions, because the startup events are of short duration, CO emissions are known to be higher during startup, and there are short term (1-hour and 8-hour) standards that apply to CO. The permit application has demonstrated that the emissions of CO during startup lead to an impact that is less than the established significance levels for these standards. Therefore, such emissions would not have a significant impact on ambient air quality.

Cooling Tower Water Vapor Plumes

Cooling towers release water vapor into the atmosphere along with a small amount of water droplets. A recent application has analyzed cooling tower water vapor plume formation, specifically addressing the development of icing and fogging conditions that can occur during very

cold weather. Results showed that cooling tower fogging or icing was not predicted to occur as a result of the operation of a similar cooling tower. It also should be noted that the proposed cooling towers *would* not be placed near any public roadways where fogging or icing could cause potentially hazardous conditions. Under the proposed design measures, cooling tower fogging and icing are not predicted for this project. No mitigation measures are planned to address this impact.

Cooling Tower Drift

Cooling towers also generate a small amount of “drift” as discussed above. The proposed drift eliminators, designed to reduce drift to 0.0005 percent of total circulating water, are comparable to the best performing drift eliminators that are in operation. The proposed dissolved and suspended solids concentration in the drift, at approximately 1,700 parts per million by weight, is low compared to the concentrations in other cooling tower operations. Given the low emission rates of PM₁₀ resulting from these drift droplets, and the anticipated low level of impact, there are no mitigation measures proposed to further reduce drift and PM₁₀ emissions from the cooling towers.

Greenhouse Gases

The project would generate large amounts of CO₂, resulting from the combustion of natural gas in the turbines and duct burners. CO₂ is a “greenhouse gas” that has the potential to contribute to global warming. There are no specific federal requirements to mitigate impacts of CO₂ emissions from the proposed facility. The use of natural gas to generate electricity from a combined cycle power plant is perhaps the most efficient method to generate electricity using fossil fuels. Recent studies, including the analysis provided for the Umatilla Generating Station, showed that the efficiency of electric generation with a similar combined cycle natural gas fired power plant was sufficient to meet the requirements of the State of Oregon’s CO₂ emission standard for energy facilities. The proposed project would provide a similar level of efficiency. No mitigation measures are proposed for this project.

3.5.3 *Proposed Action Impact Summary*

Project construction would result in disturbance and handling of surface soils at the plant site and along the pipeline corridors, access road, and transmission line route. By implementing dust control measures, the impacts of construction-related fugitive dust would be minimized. The construction activities would include periodic watering of haul roads and storage piles during

periods of observed fugitive dust transport off the site. Traffic speed limits would be established and may be specifically constrained during dry periods when fugitive dust is generated. Once constructed, the soil storage piles *would* be stabilized, roadways graveled or hard-surfaced, and exposed areas would be reclaimed or revegetated with native species or with special plantings that are maintained.

The air emissions from of project operation *would* include the discharge of air pollutants from the main stacks of the combustion turbines and duct firing units. The proposed project is classified as a major source and would be regulated under the PSD program and the Title V operating permit program. The facility must demonstrate continuous compliance with emissions of NO_x, CO, and SO₂ from these sources, and must perform periodic monitoring of other pollutants including PM₁₀ and VOCs.

The facility *would* utilize “state of the art” pollution controls including selective catalytic reduction of NO_x emissions and the use of a CO oxidation catalyst. The permit application has demonstrated that the facility *would* install BACT for NO_x, CO, SO₂, and PM₁₀. This level of BACT is equal to or better than all recently permitted power production facilities in the Pacific Northwest. The facility also *would* produce power in a very efficient and clean way with the use of steam turbines producing power from the hot exhaust gases of the combustion turbines that would otherwise be wasted. The facility also would install high performing drift eliminators on its cooling tower emissions.

The dispersion modeling for the air permit application shows that impacts of these emissions are below established significance levels for CO and SO₂. The dispersion modeling also demonstrates that predicted pollutant concentrations are well within allowable ambient air quality standards and PSD increments for NO₂ and PM₁₀ including impacts from existing industrial and farming activities, recently permitted industrial activities, existing mobile sources of emissions, and natural sources of emissions. This therefore indicates that the operation of the Wanapa Energy Center *would* not affect any existing industrial or farming activities and also *would* allow for any future growth of possible farming or industrial activities. The modeling also addressed impact on nearby pristine (Class I) areas and demonstrated acceptable impacts on visibility, soils (acid deposition), and vegetation within those areas. The operation of the proposed facility would not cause or contribute to an exceedence of any established air quality standard and would not adversely impact air quality related values.

In summary, the Wanapa Energy Center is a very clean and good alternative to older methods of electric generation, such as coal-fired power plants. Also, the Wanapa Energy Center **would** meet or exceed emission controls that have been implemented at similar facilities in the Pacific Northwest. And finally, the operation of the Wanapa Energy Center **would** not cause or contribute to any exceedences of any established air quality standards and **would** not hinder existing or future farming or industrial activities.

3.5.4 *Component Alternatives Impact Summaries- Air Quality*

The relative air quality effects of the component alternatives would be nearly the same as the Proposed Action for the gas/water discharge pipelines, transmission line alternatives, and the water supply line. It is likely that fugitive dust generation would be slightly greater for the longer pipeline routes that cross croplands and shrublands lands (Alternatives 2 and 4). Construction equipment emissions would depend on the length of the construction period for each pipeline alternative, which are presently unknown. Construction of Alternatives 5 and 6 in the county roadways may result in lower fugitive dust generation, but the construction period may be longer than other alternatives because of the relatively slower construction progress within county road right-of-ways because of less working space.

The air quality effects for constructing and operating plant discharge water facilities would be nearly the same as the Proposed Action. Electrical energy required to operate either water discharge alternative would be similar since plant discharge water would flow to the discharge by gravity.

3.6 Traffic and Circulation

Construction of the Wanapa Energy Center would most likely affect traffic flow on McNary Beach Access Road, U.S. Highway 730, and U.S. Highway 395/State Route 32. Up to 600 workers would travel to the facility site during construction, 100 to the natural gas supply/wastewater discharge pipeline routes, and 120 to the transmission line route. During operation, 30 workers would work at the facility.

3.6.1 Affected Environment

Major highways accessing the project study area include U.S. Highway 730 (i.e., U.S. Highway 730; the Columbia River Highway), U.S. Highway 395/State Route (SR) 32 (i.e., SR 32; the Umatilla-Stanfield Highway), Interstate 82 (I-82), and State Route 207 (i.e., the Hermiston Highway). U.S. Highway 730 is a 2-lane west-east highway that generally runs along the south side of the Columbia River. U.S. Highway 395/SR 32 is a 2-lane northwest-southeast highway that runs from U.S. Highway 730 in the north; through Umatilla, Hermiston, and Stanfield; and then to I-84/U.S. 30 in the south. I-82 is a 4-lane highway running north-south from the Tri-Cities in Washington until it intersects with I-84/U.S. 30. SR 207 is a 2-lane highway that runs southwest-northeast, starting at I-82 in the west, through Hermiston, and then intersecting with U.S. Highway 730 in the east. **Table 3.6-1** summarizes the average daily traffic (ADT) and accident counts by milepost and location for these major roadways for 2001.

Direct access to the project site is via McNary Beach Access Road, about 0.5 mile north of its intersection with U.S. Highway 730. McNary Beach Access Road is a narrower 2-lane paved county road. McNary Beach Access Road has a load limit of 105,000 pounds. Loads greater than this limit would require obtaining a permit from the Umatilla County Public Works Department (Phillips 2003a).

McNary Beach Access Road had a traffic count of 904 vehicles for a 24-hour period, from noon of August 25, 2003, until noon of August 26. In comparison, the same site had a traffic count of 350 vehicles per day on May 26, 1998, prior to the construction and operation of the TRCI. Peak traffic periods during the 2003 count occurred 6:00-8:00a.m. and 3:00-4:00 p.m. Average speed on the road was 46 miles per hour. (Phillips 2003b).

Table 3.6-1
Average Daily Traffic and Accident Counts - 2001

| Highway/ Milepost | Location Description | ADT | Accidents |
|-------------------------------------|--|------------|------------------|
| U.S. Highway 730: | | | |
| 182.60 | Western Umatilla city limits to Umatilla Bridge spur | 8,234 | 8 |
| 184.03 | Umatilla Bridge spur to U.S. Highway 395/SR 32 | 10,100 | 5 |
| 184.80 | U.S. Highway 395/SR 32 to eastern Umatilla city limits | 6,339 | 7 |
| 186.85 | Eastern Umatilla city limits to junction with SR 207 | 3,079 | 1 |
| Subtotal | | | 21 |
| U.S. Highway 395/ SR 32: | | | |
| 0.04 | U.S. Highway 730 to northern Hermiston city limits | 11,721 | 18 |
| 4.22 | Northern Hermiston city limits to junction with SR 207 | 17,028 | 43 |
| 5.40 | North of junction with SR 207 to south of junction with SR 207 | 20,200 | 4 |
| 5.46 | South of junction with SR 207 to southern Hermiston city limits | 10,430 | 15 |
| 8.45 | Hermiston to Stanfield | 8,377 | 4 |
| 9.25 | Stanfield | 7,491 | 7 |
| 12.44 | Stanfield to junction with I-84/US 30 | 6,700 | 0 |
| Subtotal | | | 91 |
| Interstate 82: | | | |
| 0.00 | Washington State line to northern Umatilla city limits | 15,300 | 0 |
| 0.48 | Northern Umatilla city limits to UPRR crossing | 15,300 | 2 |
| 0.76 | UPRR crossing to crossing of U.S. Highway 730 | 15,300 | 1 |
| 1.00 | U.S. Highway 730 crossing to beginning structure SBD | 9,300 | 1 |
| 1.65 | Beginning to end of structure SBD | 9,300 | 0 |
| 1.84 | End of SBD structure to southern Umatilla city limits | 9,300 | 2 |
| 2.07 | Southern Umatilla city limits to crossing of Westland-Ordinance Road | 8,978 | 5 |
| 9.78 | Crossing of Westland-Ordinance Road to junction with I-84/US 30 | 8,700 | 3 |
| Subtotal | | | 14 |
| SR 207: | | | |
| 0.02 | Junction of U.S. Highway 730 to eastern Hermiston city limits | 4,267 | 13 |
| 6.15 | Eastern Hermiston city limits to U.S. Highway 395/SR 32 | 6,909 | 5 |
| 7.30 | U.S. Highway 395/SR 32 to Northwest Buttercreek Road | 8,186 | 10 |
| 8.34 | Northwest Buttercreek Road to southern Hermiston city limits | 8,962 | 20 |
| 9.04 | Southern Hermiston city limits to junction with I-84/ US 30 | 5,404 | 7 |
| Subtotal | | | 55 |

Source: Oregon Department of Transportation (DOT) 2002.

Note: Since 1998, a crash (referred to as an accident, above) has to be reported if it occurs on a public roadway and results in a fatality, bodily injury, or damage to one person's property in excess of \$1,000.

Additional modes of transportation to the project study area include river barge access via the Port of Umatilla facilities on the Columbia River and railroad access via the UPRR, both located within or east of Umatilla and west of the project site. Air access to the study area is available via the Hermiston Municipal Airport. The airport does not have passenger or air freight service, but air charter services are available. The airport has a 4,500- by 75-foot runway (Oregon Economic & Community Development Department 2003).

3.6.2 Environmental Consequences and Mitigation

Construction of the project is estimated to take 24 to 26 months, starting in the fourth quarter of **2005**, with a ramp-up of activities during the beginning of construction and ramping-down at the end. Most construction materials and equipment likely would be shipped to the project site by the statewide and regional highway transportation system. Regional transportation access would be via U.S. Highway 730, located about 0.5 mile south of the project access road, and then McNary Beach Access Road. The new paved access road would be about 7,525 feet (1.4 miles) long and would extend from the McNary Beach Access Road to the power plant site. Large power plant equipment, such as the turbines and steam generators, might be shipped by rail and then offloaded in Hermiston or Umatilla for trucking to the project site on U.S. Highway 395/SR 32 or U.S. Highway 730. Alternatively, this equipment could be barged to the Port of Umatilla and then offloaded and transported by the McNary Beach Access Road to the project site. Major construction equipment accessing or being hauled to the various components of the project could include personal vehicles, light and heavy trucks, welding trucks, farm tractors, backhoes, bucket-wheel excavators, concrete trucks, bulldozers, graders, side booms, and cranes.

The large power plant and construction equipment may require transport of wide and/or long loads, requiring lead and/or follow-up vehicles and would be slower moving than typical lighter vehicles such as cars, and pickup trucks. Thus, these large tractor trailer and other vehicles could result in some traffic congestion and an increase in the potential for vehicular accidents. Assuming that the majority of workers and truck deliveries would turn north from U.S. Highway 730 onto Beach access road, it is likely that from 300 to 500 personal vehicles could turn left or right off U.S. Highway 730 onto Beach Access road at shift changes over a period of 1 to 2 hours. This traffic increase would be 10 to 20 percent of the current daily traffic on this segment of U.S. Highway 730; the estimated traffic increase for Beach Access Road would be 30 to 60 percent of the current daily traffic levels.

To reduce the potential for pipeline construction impacts on traffic, when constructing in or near a roadway, one traffic lane would always remain open. Some major roadways might be directionally bored to avoid damage to the travel surface and traffic disruptions. It is assumed that basalt mostly underlies U.S. Highway 730, so an open cut crossing is planned there and a traffic control plan would be implemented to avoid disruptions to traffic. Railroads and irrigation canals would be directionally drilled to avoid loss of service.

In addition, 100 to 600 workers would be traveling to the project site during the 24 to 26 months of construction, 100 would be working on the natural gas supply/wastewater discharge pipeline routes over 3 months, and 120 would be working on the transmission line route over 4 months. These workers may travel to the construction sites with private vehicles, by carpooling or vanpooling, or some could be bused to the site. These workers would likely originate from throughout Umatilla County, Morrow County, and the Tri-Cities area in Washington, and would represent a dispersed increase in traffic into the study area.

Beginning in the fourth quarter of **2007**, the project would operate 24 hours each day, 365 days a year. During operation, 30 workers would be accessing the facility, likely over the course of three work shifts. Most of this vehicular access to the project site would be with private vehicles and trucks from Hermiston, Umatilla, or other parts of Umatilla County. Additional truck traffic would occasionally occur to the project site to deliver materials and supplies, and to conduct maintenance and repairs. The impacts of this traffic would be minimal and would require no mitigation.

Recommended Mitigation.

T-1. Implement partial plant site shift changes to reduce the number of personal vehicles that queue at the Beach Access Road/U.S. Highway 730 intersection.

T-2. Time major construction material deliveries to off-peak hours (early morning, late evening) to prevent local congestion on U.S. Highway 730.

T-3. A site-specific construction traffic flow plan would be submitted to the Oregon DOT that documents the present traffic volumes, expected volume of project construction traffic, and the intersections to be used. If warranted by this study, the width of the U.S. Highway 730 at the Beach road intersection (or other intersections) would be expanded to provide left-hand and right-hand turn lanes.

3.6.3 *Proposed Action Impact Summary*

Project construction and operation would result in increased traffic on U.S. Highway 730, U.S. Highway 395/SR 32, and local roads. Temporary traffic increases on access roads during a 24- to 36-month period for power plant construction. Temporary traffic increases on roads used for the pipelines and electric transmission line would occur during a 3- and 4-month period, respectively. Increased traffic levels also would result in an increased risk for accidents. Increased traffic for an estimated 30 workers would occur during plant operation. Impacts on traffic levels and flow and accident risks would be reduced by implementing a traffic flow plan, timing major construction traffic during off-peak hours, and use of partial site shift changes at the plant.

3.6.4 *Component Alternatives Impact Summaries*

Gas and water discharge pipelines construction effects on local traffic and circulation would consist of open cut road crossings across gravel roads, and boring under larger highways and paved roads. Railroads would be bored. The pipeline route options are similar in the number of highway and county road crossings that would be required (Figure 3.6-1). However, Alternative 5 and 6 would be installed in the county road right-of-ways, either in the roadway, or next to the roadway, with equipment stationed on the road. This construction could require one way traffic with traffic controllers, or detours. As a consequence, travelers on Craig, Walls, and Edwards Roads could experience detours or short-term delays for several weeks during the construction period. Electrical transmission line construction would not interfere with local traffic except for very short periods of time when the conductors are pulled through conductor reels above road crossings. Construction of the plant discharge water pipeline would coincide with gas pipeline construction for any of the gas pipeline alternatives; no construction near, or in highways and county roads would be required to construct the plant discharge water pipeline between the plant site and the Columbia River .

3.7 Visual Quality and Noise

3.7.1 Affected Environment

3.7.1.1 Visual Quality

The project site is located in a rural area on a relatively flat bluff about 150 feet above the Columbia River. The site is characterized by basalt outcrops, shrub-steppe habitat, and wetlands, with some scattered trees. The views to the north are of the wide Columbia River (Lake Wallula) and croplands, rangeland, shrub-steppe habitat, and scattered agricultural residences and buildings on the Washington State side of the river. The views to the east also are of the Columbia River and shrub-steppe habitat on the Oregon side of the river. To the south, high brush and smaller trees diversify the view of the surrounding landscape. To the west lies similar shrub-steppe habitat but the view is dominated by the TRCI, a large medium custody facility located about 1.5 miles west of the project site. The facility is an industrial-looking 650,000-square-foot concrete facility surrounded by tall fences with a guardhouse at the entrance. This facility is well-lit and visible at night.

The existing and proposed electrical transmission line and natural gas supply/wastewater discharge pipeline route is comprised of rural residences, irrigated croplands, non-irrigated croplands, grazing land, and low-growing shrub-steppe land.

3.7.1.2 Noise

The existing sound levels in the project area are characterized by rural, ambient/background noises. The closest potential noise source or receptor is the TRCI, located about 1.5 miles west of the project site. Although the background noise levels were not measured, it was estimated that they were in the 35- to 40-decibel range during a site visit.

The Oregon DEQ does not issue noise permits, but industrial facilities must meet the DEQ's noise standards (OAR Chapter 340). These standards require that:

No person owning or controlling a new industrial or commercial noise source located on a previously unused industrial or commercial site shall cause or permit the operation of that noise source if the noise levels generated or indirectly caused

by that noise source increase the ambient statistical noise levels, L_{10} or L_{50} , by more than 10 decibels on the A-weighted scale (dBA) in any 1 hour, or exceed the levels specified in **Table 3.7-1**, as measured at an appropriate measurement point, as specified in subsection (3)(b) of this rule.

Table 3.7-1
New Industrial and Commercial Noise Standards (340-35-035),
Allowable Statistical Noise Levels in any 1-Hour

| 7:00 am – 10:00 pm | 10:00 pm – 7:00 am |
|---------------------------|---------------------------|
| $L_{50} - 55$ dBA | $L_{50} - 50$ dBA |
| $L_{10} - 60$ dBA | $L_{10} - 55$ dBA |
| $L_1 - 75$ dBA | $L_1 - 60$ dBA |

The proposed power plant would operate 24 hours per day, 365 days a year, so the nighttime (i.e., 10:00 p.m. – 7:00 a.m.) noise standards would apply.

3.7.2 Environmental Consequences and Mitigation

3.7.2.1 Visual Quality

The project would result in the introduction of a new industrial facility into the relatively natural area. The facility would include a turbine building, the administration building, the water treatment building, a natural gas metering building, a warehouse, switchyard, raw water storage tank, demineralization water storage tank, cooling towers, HRSGs, and four 213-foot-tall HRSG exhaust stacks. An analysis was conducted using a Digital Elevation Model to determine the locations where the stacks of the generating facility could be seen over a radius of approximately 4 miles from the site. The results of this analysis are illustrated on **Figure 3.7-1**. The visibility of the project and the distance, in miles, from various key viewing locations are described in **Table 3.7-2**.

The facility could be viewed from residential areas at McNary, residences on the Columbia River bluff near Hat Rock State Park, and by motorists traveling U.S. Highway 730 east of Umatilla.

Table 3.7-2
Scenic Visibility Effects at Public Use Areas

| Feature | Visibility and Distance from Project (Miles) |
|---|---|
| Columbia River (Lake Wallula) | The project would be visible to recreational boaters, anglers, and windsurfers using the Columbia River, 0.2 mile north of the project site. |
| McNary Beach State Park and Recreation Area | Would not be visible, 1.7 air miles northwest of the site along the Columbia River (RM 295) and 150 feet below the bluff. |
| Hat Rock State Park | Would not be visible, 2.9 air miles east of the site and in a 150-foot ravine below the Columbia River bluff (RM 299). |
| Columbia River Gorge National Scenic Area | The power plant and exhaust stacks would be visible from the Columbia River, but would be about 80 air miles east of and not seen from the Gorge Scenic Area. |
| Cold Springs National Wildlife Refuge | Could be visible to wildlife observers, hikers, horseback riders, and bicyclers, about 4.6 air miles to the southeast of the project site. |

Figure 3.7-2 provides simulations of the proposed plant and stacks at distances of approximately 1 mile and 2 miles to provide perspective on the scale of the facility. There is almost no natural screening provided by trees except along U.S. Highway 730 parallel to the Wanaket Wildlife area, where trees and shrubs adjacent to the highway screen the view to the north.

In addition to the above, Wanaket Wildlife Area is located east of the project site and the facility would be visible to hunters during hunting season. In addition, the TRCI is located about 1.5 miles west of the project site and the project would be visible from that location. Also, the McNary Dam is located about 3.0 miles west of the project site and could be visible from there. The tallest and most visible parts of the power plant would be the four 213-foot-tall HRSG exhaust stacks and the turbine building. In addition, at times the project would emit a visible steam plume from the cooling towers that would be visible over a wide area.

At night, the facility would be illuminated with lights on utility poles. These lights would be shielded to reduce glare and overall visibility from public roads and residences. In addition, to meet FAA requirements, the exhaust stacks also would be lit with warning lights that would be visible for extended distances.

The 500-kV transmissions line exiting the power plant facility and connecting to BPA's McNary Substation would be visible to area residents and vehicular traffic on area highways and roads (i.e., McNary Beach Access Road, U.S. Highway 730, and U.S. Highway 395/SR32). The aesthetic impact of these lattice tower transmission lines would depend upon whether they are a new element to the landscape, and single- or double-circuit towers are being used. Single-circuit towers can be up to 145 feet tall and double-circuit towers can be up to 180 feet tall. Where the new ROW paralleled an existing ROW, the towers would be located parallel to existing towers (i.e., not staggered) to avoid the additional visual disruption that would otherwise be created. These towers would be located in a 150- to 200-foot-wide ROW and would contain 16- to 20-foot-wide access roads. Expanding the McNary Substation by another 160 by 750 feet, or about 2.75 acres, would result in a minor additional aesthetic impact to the existing substation in an industrial area.

Recommended Mitigation Measure. No mitigation measures would be required for visual resources.

3.7.2.2 Noise

During construction, noise would be generated by graders, bulldozers, cranes, other construction equipment, power hand tools, dump trucks and semi-trailer trucks, and by personal vehicles. Some rock drilling and blasting may be required to level the site and would generate additional noise. To minimize the amount of disturbance that could occur during the constructing phase, construction would only occur between the hours of 7 a.m. and 5 p.m. Because the nearest consistent noise receptors are the residents and workers at the TRCI, located about 1.5 miles west of the project site, noise impacts are expected to be minimal to these receptors during construction and operation. The occasional recreational users of the Columbia River, located 0.2 mile (at the closest point) to the north of the project site, and hunters on the nearby Wanaket Wildlife Area could be affected by the noise generated during construction and operation of the project.

During operation, noise would be generated by the combustion turbines and generators, HRSGs and steam turbines, transformers, the cooling towers, other operating equipment, and by vehicles. Noise level estimates have not yet been generated for this project, but the applicants commit to meeting the state industrial standards at the plant site fenceline.

Electrical transmission conductors can cause corona noise, which is a hissing, crackling sound that is most evident during wet weather (rain, fog). The BPA has established a design criterion for corona-generated audible noise from transmission lines of 50 dBA exceeded 50 percent of the time at the edge of the ROW (BPA 2002). This noise level is equivalent to moderate rainfall on foliage. No residential or commercial structures are located within 100 feet of the proposed transmission line centerline, which equates to the edge of the ROW for the purposes of establishing the noise criterion.

Recommended Mitigation Measure. No mitigation measures would be required for noise.

3.7.3 *Proposed Action Impact Summary*

3.7.3.1 Visual Resources

Construction of the power plant facility would result in visual impacts on residential areas at McNary and on the Columbia River bluff near Hat Rock State Park, motorists using U.S. Highway 730 east of Umatilla, and hunters in the Wanaket Wildlife Area. The most visible parts of the facility would be the HRSG exhaust stacks and the turbine building. In addition, a steam plume from the cooling towers would be visible in winter over a wide area. Facility lighting at night also would be seen from public roads and residences. Construction of the electric transmission line would be seen by area residents and motorists on area highways and roads. The visual effect would depend on whether the use of single or double circuit towers and whether the structures are new landscape features. The effects of the McNary Substation expansion would be considered minor, since the expansion area is industrial.

3.7.3.2 Noise

Increased noise levels would occur in the local area as a result of construction equipment, traffic, and facility operation. Construction traffic would be short term for the plant (24 to 36 months), pipelines (3 months), and transmission line (4 months) and long term for plant operation. By

scheduling construction between 7 a.m. and 5 p.m., the duration of noise during the day would be minimized. Noise impacts would be minor, since the residences and the TRCI are 1.5 miles from the plant. Recreational users of the Columbia River (0.2 mile from the plant) and hunters on the Wanaket Wildlife Area could be affected by construction and operation noise.

Implosive fittings would be used to connect lengths of transmission line conductor. The loud noise of the implosion would reverberate for a few seconds.

3.7.4 Component Alternatives Impact Summaries

Visual quality effects associated with the gas/plant discharge water pipeline route alternatives would be primarily confined to areas where the public can view the landscape contrasts (e.g., a linear grassland discontinuity caused by the revegetated pipeline ROW within in a native shrubland). The major public viewpoints of these landscape changes would be evident along Highway 730, which is bounded by native shrub communities on each side. The Proposed Action, and Alternatives 3, 4, 5, and 6 would be located parallel to Highway 730 for distances ranging from 0.5 mile (Proposed Action) to approximately 4 miles for Alternative 3. These visual quality changes would be long term because of the long-term recovery time for shrubland communities. The majority of the remaining lengths of all alternatives would cross cropland where the pipeline ROW would not be evident after crops are replanted.

There would be visual quality differences among the electrical transmission line and plant discharge water location alternatives. These differences are compared in Table 3.7-3 and 3.7-4 respectively.

Noise effects associated with the gas/plant discharge water pipeline alternative would be confined to short-term construction activities (trenching, pipelaying, and backfilling) conducted near residences. There are distinct differences in the number of residences that would be affected by construction noise. The Proposed Action, and Alternatives 1, 3, and 4 are located away from roads and residential areas, and consequently 12 to 16 residential structures are located within 200 feet of the construction areas. Alternatives 2, 5, and 6 are located adjacent or within existing roads where many residences are also located. Construction of any one of these latter alternatives would pass within 200 feet of 42 to 44 residential structures (see 3.9 Land Use and Recreation).

Table 3.7-3
Electric Transmission Line Alternatives Comparison – Visual

| Resource/Impact Issue | Alternatives | | | | |
|------------------------------------|--------------|--|--|---|--|
| | No Action | Proposed Action | 1 | 2 | 3 |
| Visual Resources | | | | | |
| Visual effects on public use areas | No impact | The transmission line segment located in a new ROW between the plant site and the existing BPA transmission corridor would represent a new industrial element to viewers along Highway 730, and visitors to the Wanaket Wildlife Area. | The transmission line segment located in a new ROW between the plant site and the existing BPA transmission corridor would represent a new industrial element to viewers along Highway 730, and visitors to the Wanaket Wildlife Area. | The transmission line would represent a new industrial element that traverses the Columbia River bluff between the TRCI and the McNary Substation (about 2 miles). The transmission line would intercept the view of approximately 17 McNary residences that overlook the Columbia River and McNary Dam. The transmission line would represent a new industrial element for visitors to the McNary State Park and the COE park facilities at McNary Dam and visitor center. | The transmission line would represent a new industrial element that traverses the Columbia River bluff from Wanapa Plant Site to the McNary Substation (about 3 miles). The transmission line would intercept the view of approximately 17 McNary residences that overlook the Columbia River and McNary Dam. The transmission line would represent a new industrial element for visitors to the McNary State Park and the COE park facilities at McNary Dam and visitor center. |

Table 3.7-4
Plant Discharge Location Alternatives Comparisons – Visual

| Resource/Impact Issue | No Action | Proposed Action | Alternative 1 |
|-----------------------|---|---|---|
| Visual Resources | No new facilities would be built, and therefore no changes in the rural landscape would occur. | The wastewater pipeline segment between the natural gas pipeline ROW and Cold Springs Reservoir would be located in cropland, or adjacent to an existing roadway, and therefore would not contrast with current land cover. | The wastewater pipeline segment between the plant site and the Columbia River would cross a tall sagebrush community. The new pipeline ROW would represent a sharp discontinuity in color and form. This new ROW could be easily seen by boaters on Lake Wallula, but would not be seen from any public roadways on the south side of the Columbia River. |
| Noise | No new facilities would be built, and therefore no new construction or operational noise would occur. | The wastewater pipeline segment between the natural gas pipeline/Feed Canal intersection and Cold Springs Reservoir would be constructed within 200 feet of one residential structure, resulting in increases in construction noise and traffic over a period of about 1-2 weeks. The remainder of the surface disturbance for the waste water pipeline is included in the ROW for the gas supply pipeline, which is the same for both alternatives. There would be no operational noise. | The wastewater pipeline segment between the plant site and the Columbia River would not be constructed within 200 feet of any residential structures. There would be no operational noise. |

It is predicted that 8 residences located within 300 feet of the Proposed Action and Alternative 1 electrical transmission line routes could experience corona noise that slightly exceeds the Oregon state standard of 50 dBA at the edge of the ROW (See 3.11, Public Safety). The other two alternatives would be located at greater distances from existing residences.

Construction of any of the plant discharge water pipeline route alternatives that deliver water to Cold Springs Reservoir would cause short construction noise near residential areas where the water pipeline is co-located with the gas supply pipeline (see discussion above, and Land Use). The plant discharge water location alternative that delivers water to the Columbia River would not be located near any residences.

3.8 Cultural Resources

Federal historic preservation legislation provides a legal environment for documentation, evaluation, and protection of ***cultural resources*** that may be affected by federal undertakings, or by private undertakings operating under federal license, permit, or approval or on federally managed lands. The NEPA of 1969 states that federal undertakings shall take into consideration impacts to the natural environment with respect to an array of disciplines, and that alternatives must be considered. The courts have made clear that cultural resources are regarded as part of the natural environment. The National Historic Preservation Act (NHPA) of 1966, as amended, established the Advisory Council on Historic Preservation and the National Register of Historic Places (NRHP) in its modern form. The NHPA mandates that federal agencies consider projects' effects on cultural resources that are ***listed*** or eligible ***for inclusion in*** the NRHP and Section 106 of the NHPA establishes a four-step review process by which cultural resources are given consideration during the conduct of federal undertakings. The four steps of the Section 106 review process are: 1) initiation of the Section 106 review process (i.e., establish the undertaking, identify appropriate SHPO and/or Tribal Historic Preservation Office (***THPO***), plan to involve the public, identify other consulting parties); 2) identification of historic properties (***i.e., those cultural resources included in, or potentially eligible for inclusion on the NRHP***); 3) assessment of adverse effects; and 4) resolution of adverse effects. The Archaeological and Historic Preservation Act of 1974 further delineates the responsibilities of federal agencies in the execution of undertakings with respect to impacts on cultural resources. The Archaeological Resource Protection Act of 1979, as amended, provides for a system of permitting for investigations on federal land which may involve looking for and the removal of artifacts or other archaeological resources. The statute also requires that agencies develop compatible regulations for the management of cultural resources.

The effects of federal undertakings on properties of religious or cultural significance to contemporary Native Americans, including traditional cultural properties (TCPs), are given consideration under the provisions of the American Indian Religious Freedom Act of 1978 (AIRFA), ***Archaeological Resource Protection Act (ARPA)***, ***Executive Order 13007 (Sacred Sites)***, ***Executive Order 12898 (Environmental Justice)***, and recent amendments to the NHPA. As amended, the NHPA now integrates Indian tribes into the Section 106 compliance process, and also strives to make the NHPA and NEPA procedurally compatible. In compliance with Section 106, federal agencies must consult with a representative designated by the tribe.

The **NHPA** process begins with consultation with the SHPO *and/or THPO* ¹. to determine the undertaking's area of potential effect, an identification and evaluation of cultural resources for NRHP eligibility, followed by an assessment of effect on those **historic properties**, and concluding after the consultation process between the SHPO/THPO, jurisdictional agency, *and affected Tribe(s)*. In order for a cultural resource to be **considered an historic property**, it must meet one or more of the following **NRHP** criteria of significance: a) be associated with events that have made a significant contribution to the broad patterns of our history; b) be associated with the lives of persons significant in our past; c) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; or, d) have yielded, or may be likely to yield, information important in prehistory or history. In addition, **historic properties** must possess integrity of location, design, setting, materials, workmanship, feeling, and association (National Park Service [NPS] 1991).

3.8.1 Affected Environment

3.8.1.1 Plant Site

Archaeological Resources

In September 2001, the **CTUIR** Cultural Resources Protection Program (CRPP) conducted a literature search and records review through the Oregon SHPO as part of the cultural resources investigation for the proposed Wanapa Energy Center plant site. The **CTUIR** CRPP reviewed all previously completed cultural resources surveys and all previously recorded archaeological sites and properties listed on the NRHP within 1 mile of the proposed plant site. Since the late 1940s, numerous cultural resources studies have been completed in the area of the plant site with the majority being inventory surveys. Excavation of individual sites also has occurred, beginning with those associated with the 1947 River Basin Surveys associated with the Columbia Basin Project.

As a result of the file search, 10 sites were identified within 1 mile of the plant site. Five sites were recorded during the McNary Reservoir surveys from the late 1940s through the 1950s; none of these sites are within the plant site boundary. Since that time five additional sites have been recorded primarily under Section 106-driven projects.

¹ *The Tribal Historic Preservation Officer is consulted in lieu of the State Historic Preservation Officer when resources are located on reservation or on off-reservation tribal trust lands.*

On October 9 and 10, 2001, the **CTUIR** CRPP conducted a cultural resources field survey of the proposed Wanapa Energy Center plant site. During the survey, two isolated finds were recorded (Miller 2001). These isolated finds are not eligible for inclusion in the NRHP; therefore, there *would* be no effect per the NHPA (16 U. S. C. §§ 470-470x-6).

One aqueduct currently in use is within the plant site boundary. The aqueduct is part of the Wanaket Pump System, which received its original ROW from the USACE on May 30, 1949 (Umatilla County, Deed Volume 189, Page 174, Charles Kik). The field crew observed 22-inch-diameter ceramic pipes in 53-inch-long sections and segments of 24-inch-diameter iron pipe. Two piles of 25-gallon cans and two cement blocks also were noted. All of these features appear to be associated with the aqueduct and pumping stations. There is no evidence indicating that these features are over the 50 years old necessary to qualify them as an archaeological site; therefore, they were not recorded.

Traditional Cultural Properties

There are many definitions of the word “culture,” but in the National Register programs, the word is understood to mean the traditions, beliefs, practices, lifeways, arts, crafts, and social institutions of any community, be it an Indian tribe, local ethnic group, or the people of the nation as a whole. One kind of cultural significance a property may possess, and that may make it eligible for inclusion in the NRHP, is traditional cultural significance. “Traditional” in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The traditional cultural significance of a historic property, then, is significance derived from the role the property plays in a community’s historically rooted beliefs, customs, and practices (NPS Bulletin 38).

Some places of traditional cultural use may be eligible for inclusion in the NRHP as a **traditional cultural property** (TCP) because of their association with cultural practices or beliefs of a living community that: a) are rooted in that community’s history and b) are important in maintaining the continuing cultural identity of the community (Parker and King 1989). Since **traditional cultural properties** identified by **a community** are important in each **community’s** history, and since the resources are interconnected with places and resources, any impacts to **traditional cultural properties** would be regional in scope. In addition, because **traditional cultural properties** are tied

to communities' cultural identities, effects to *the property* also have an effect on the communities to which they are tied in perpetuity. Therefore, the duration of impacts to *traditional cultural properties* is forever.

The CRPP of the CTUIR was responsible for a TCP assessment of the proposed Wanapa Energy Center plant site. A file and literature search was conducted using *CTUIR* CRPP archives to identify known archaeological sites and obtain pertinent information about past and present customary and/or traditional use of the areas within and around the plant site. Past archaeological surveys and reports, ethnographic reports, reports on CTUIR ceded lands, and sensitive and confidential information were reviewed. An informational flyer regarding the Wanapa Energy Center project and site visit dates were mailed to 175 Tribal Elders requesting their assistance in this project. Two site visits to the proposed plant site were conducted during October 2001 with twenty Tribal Elders and four *CTUIR* CRPP staff. Oral history interviews with Tribal Elders were conducted on October 10 and 16, 2001 (Farrow 2001). The outcome of the assessment was that the area of the Wanapa Energy Center is a TCP.

The proposed Wanapa Energy Center would be located on lands ceded by representatives of the CTUIR to the U.S. Government in the Treaty of 1855. The land is now held in trust by the United States for the CTUIR as beneficial owners and is still used for hunting and resource procurement.

3.8.1.2 Transmission, Water Supply, and Gas/Plant Discharge Water Lines

In August 2003, Archaeological Investigations Northwest, Inc. conducted a literature and file search through the Oregon SHPO for the proposed transmission, water *supply*², and gas/*plant discharge water* lines. The literature search study area extends 1 mile from the transmission, water *supply*, and gas/*plant discharge water* alignments and encompasses 59 square miles, which also includes the proposed plant site. The literature and file search was directed primarily toward identifying previous cultural resource studies that had been conducted within the study area and previously identified cultural resources in the study area. Forty-three cultural resource surveys have been conducted in the study area since the mid-1970s and generally have been located between the cities of Umatilla and Hermiston, with the majority of the work focused near Umatilla. Previous surveys in the study area primarily cover the area around the proposed Wanapa Energy Center, 840 acres of the Wanaket Wildlife Area, the Department of Corrections prison site, the Williams

² *Water supply line ROW would be utilized for potable water and sanitary sewer pipelines.*

Northwest Pipeline alignment south and west of Cold Springs Reservoir, and a north-south portion of the Level 3 fiber optic cable alignment.

Sixteen of the surveys conducted in the study area resulted in the discovery of no cultural resources. These negative surveys were conducted for highway improvement projects, wastewater facility projects, energy facility projects, improvements at Hat Rock State Park, and a water diversion project, with most situated near the city of Umatilla. All of these projects were linear surveys with the exception of the work done at Hat Rock State Park.

Twenty-seven of the surveys in the study area recorded prehistoric or historic-period resources. These surveys include a variety of projects, with most being linear surveys for transmission lines and pipelines, new roads or road improvements, or improvements at McNary Dam.

There were 22 sites identified as a result of the literature and file search, including 12 prehistoric sites, 7 historic period sites and 3 multi-component sites (sites containing both prehistoric and historic period resources) (Baker and Ellis 2003). Three of the sites are considered significant; one is listed in the NRHP, one has been recommended as eligible, and one has been *formally* determined eligible. In addition, two historic-period structures have been recorded as significant resources, the Cold Springs Dam and major associated elements of this irrigation system and McNary Dam.

Extending across the study area are both active and abandoned segments of irrigation systems developed between 1900 and 1930 by private interests and by the BOR as part of the Umatilla Basin Project. ***On October 12, 1999, the BOR and SHPO concurred that the Umatilla Project is eligible to the NRHP as a linear and discontinuous historic district.*** Five elements of the Cold Springs portion of the Umatilla Basin Project (the Cold Springs Dam, the Furnish Ditch, the Feed Canal, the Feed Canal Diversion Dam, and the A-Line Canal) ***are contributing features to this historic district*** (Baker and Ellis 2003). ***In March 2000 the I-Line Canal was determined to be a contributing feature.*** In addition, the Three Mile Diversion Dam on the Umatilla River and the West Extension Irrigation Canal, which also were constructed by the BOR as part of the Umatilla Basin Project, ***also are contributing elements to this historic District.***

Those portions of the proposed action for the proposed transmission and plant discharge water/gas lines located on public lands have been surveyed. (For the proposed transmission line this includes the area around McNary Substation and the line through Township 5 North,

Range 28 East, Section 13 and Township 5 North, Range 29 East, Section 18, WM. For the proposed plant discharge water/gas line, the area surveyed was located in Township 5 North, Range 29 East, Section 18, WM as well as the segment along the Feed Canal in Township 4 North, Range 29 East, Sections 3 and 4, WM.) Field surveys would be conducted by the CTUIR CRPP for the remaining portions of the proposed action prior to project-related construction.

As a result of the survey on public lands, one pre-contact isolated find, one eligible historic property and one potential site were located. The historic property is the Feed Canal, which was discussed earlier as an eligible property and part of the NRHP eligible Umatilla Basin Project. One aqueduct was located along the transmission line corridor. Additional research is necessary to determine whether or not the aqueduct is greater than 50 years of age and therefore, a potential historic property. Results of the field surveys for the transmission and water/gas line alternatives would be reviewed by the SHPO.

3.8.2 *Environmental Consequences and Mitigation*

3.8.2.1 Plant Site

Two isolated finds were located during the cultural resources field survey of the plant site. Isolated finds are not eligible for inclusion in the NRHP; therefore, there *would* be no effect to cultural resources in accordance with the NHPA, as amended. The aqueduct, currently in use, and remnants of piping and cement slabs from earlier use of the aqueduct are located within the plant site. However, there is no evidence indicating that these features are over the 50 years old necessary to qualify them as an archaeological site. *Subsurface cultural resource testing would be conducted prior to construction authorization.*

The CTUIR CRPP considers the Wanapa Energy Center plant site to be a TCP.

Burials and subsurface cultural material may be encountered during project construction on tribal trust lands. If human remains or subsurface cultural material are inadvertently discovered, all work in the vicinity of the find would cease, the THPO and SHPO would be notified, and in the case of ancestral remains, the NAGPRA procedures would be followed, and the CTUIR's Policy and Procedure Manual for the Repatriation of Ancestral Human Remains and Funerary Objects would be implemented.

Recommended Mitigation

C-1. The CTUIR CRPP considers the Wanapa Energy site to be a Traditional Cultural Property (TCP). Therefore, the CTUIR CRPP would: 1) ensure that a CTUIR CRPP Tribal Monitor is present during all ground disturbing activities; 2) the CTUIR CRPP would be consulted throughout the entire planning and construction process until the project is completed; and 3) the CTUIR CRPP would participate in appropriate mitigation planning to maintain traditional uses of the site and/or develop appropriate mitigation plans, as necessary.

3.8.2.2 Transmission, Water Supply, and Plant Discharge Water/Gas Lines

Based on the file search data, the proposed ***plant discharge*** water and gas lines would cross one previously recorded historic site, which was previously recommended as not eligible to the NRHP, and three NRHP-eligible elements of the Cold Springs irrigation system: the A-line Canal, the Feed Canal, and the Furnish Ditch. ***One isolated find and the Feed Canal were identified during the cultural resources field survey of those portions of the proposed action for the transmission and gas/water line on public lands. Isolated finds are not eligible for inclusion in the NRHP; therefore, there would be no effect to cultural resources in accordance with the NHPA, as amended. Prior to construction, a determination would be made regarding the age of the aqueduct identified along the proposed action of the gas/water line and whether or not it is an historic property and therefore, whether mitigation measures are necessary.***

Burials and subsurface cultural material may be encountered during project construction on federal, state, and private lands. If human remains or subsurface cultural material are inadvertently discovered, all work in the vicinity of the find would cease, the THPO and SHPO would be notified. In the case of ancestral remains, the NAGPRA procedures would be followed and the CTUIR's Policy and Procedures Manual for the Repatriation of Ancestral Human Remains and Funerary Objects would be implemented.

Recommended Mitigation

C-2. Upon concurrence from the SHPO and THPO, adverse effects to the three NRHP-eligible canals and ditches would be avoided by horizontally boring under these features rather than trenching through them.

3.8.2.3 Cold Springs Reservoir

A detailed cultural resources assessment was not completed around the reservoir perimeter, and none was considered necessary because Wanapa Energy Center project operations would not raise the reservoir storage pool above authorized levels. No changes in existing reservoir facilities or historical operations are proposed as part of this project. If water delivery facilities (such as a new drop structure) are proposed in the future, then the BOR would conduct additional NEPA analysis, and cultural surveys and appropriate mitigation would be completed in areas proposed for disturbance prior to construction.

3.8.3 Proposed Action Impact Summary

No NRHP-eligible sites were located during the cultural resources field survey of the plant site. *The CTUIR CRPP determined through interviews with tribal elders that the plant site is considered a traditional cultural property by the Umatilla and the Walla Walla tribes. As a consequence, the project would: 1) ensure that a CTUIR CRPP Tribal Monitor is present during all ground disturbing activities; 2) the CTUIR CRPP would be consulted throughout the entire planning and construction process until the project is completed; and 3) the CTUIR CRPP would participate in appropriate mitigation planning to maintain traditional uses of the site and/or develop appropriate mitigation plans, as necessary.*

If subsurface cultural material or human remains were located during project-related construction, all work would cease, the CTUIR *would be* notified, and, in the case of ancestral remains, the *CTUIR's Policy and Procedure Manual for the Repatriation of Ancestral Human Remains and Funerary Objects would be implemented* in consultation with the THPO. Therefore, any cultural resources excavated within the plant site would receive the appropriate level of treatment as defined by the THPO.

Based on the file search, the proposed *plant discharge* water and gas lines would cross two NRHP-eligible historic canals and one NRHP-eligible ditch. Upon receiving concurrence from the SHPO, adverse effects to the canals and ditch would be avoided by boring under these historic features; therefore, no impacts to the canals and ditch are expected to occur. *One potential historic property requiring additional investigation was located during the partial field survey of the transmission and gas/water proposed action routes. Additional field surveys of those portions of the proposed action not on public lands would be required to determine the location and importance of*

cultural resources within the ROWs. Adverse impacts and mitigation procedures would be determined in consultation with the SHPO. Monitors may need to be present during construction on portions of the transmission, water supply, and gas/plant discharge water lines on federal, tribal, private, and state lands. Inadvertent discovery procedures would be the same as those described for the plant site tribal trust lands.

There would be no adverse effects to historic properties associated with Cold Springs Reservoir because water storage levels would not exceed currently authorized levels.

3.8.4 Component Alternatives Impact Summaries

The gas supply pipeline, plant discharge water pipeline, and electrical transmission Proposed Action and alternative routes have not been field surveyed on private, state, or all federal lands. As a consequence, route comparisons based on the occurrence (number and potential eligibility) of cultural resources are not possible for these components. All the gas supply pipeline and plant discharge alternatives (Proposed Action, Alternatives 1 through 6) would require crossings of two NRHP-eligible Umatilla Irrigation System canals (A-Line Canal, Furnish Ditch), and would parallel the Feed Canal on its north side. The Alternative 6 discharge water pipeline would parallel the Feed Canal over a shorter distance (0.3 mile versus 1.3 miles) as compared to the other discharge water pipeline alternatives. As stated for the Proposed Action, all NRHP-eligible canals would be bored to avoid effects on these properties, and additional surveys may be required to determine the necessary offset between the water discharge pipeline and the adjacent Feed Canal.

The Plant Discharge Water Alternative 1 pipeline route from the plant site to the Columbia River (Figure 2.4-11) could cross potentially important archaeological sites. This conclusion is based on prior cultural resource surveys.

If an approval to construct the project is granted in the BIA, BPA, and BOR Records of Decision, then pre-construction cultural surveys must be completed within the area of potential effect. THPO/SHPO coordination for inadvertent discoveries and ancestral remains would be followed for the portions of the utility routes on tribal, federal, state, and private lands. Because the alternative discharge water pipeline to the Columbia River (Alternative 1) would be located within the boundaries of a Traditional Cultural Property (TCP), Mitigation Measure C-2 would be applied to all ground disturbing activities associated with this pipeline route.

3.9 Land Use and Recreation

The primary land use and recreational issues include conversion of existing natural and agricultural land uses to industrial uses for project facilities, and potential impacts to nearby residents and visual impacts to recreational users.

3.9.1 Affected Environment

3.9.1.1 Land Use

Land Uses

The proposed plant would be constructed on approximately 47 acres out of 195 acres of Tribal Trust Land owned by the CTUIR, located approximately 4 miles east of Umatilla, in Umatilla County, Oregon (**Figure 1.1-1**). It would be located in the southern one-third of Section 7, Township 5 North (T5N), Range 29 East (R29E). The land would be leased from the CTUIR, which owns and manages land within and adjacent to the site on the east and south. The northern property boundary is a fence line located immediately south of an old railroad grade that parallels the southern bank of the Columbia River. The Port of Umatilla owns the land situated immediately south and southwest of the site. The TRCI is located on state land approximately 1.5 miles west of the site. The Wanaket Wildlife Area borders the site on the east and is just south of Port of Umatilla land on the south and southwest.

The project electrical transmission line, pipelines, and access road would cross Port of Umatilla land, BPA ROWs, grazing lands, irrigated croplands, an interstate highway and other paved and unpaved roads, and other private and public properties.

The Wanaket Wildlife Area encompasses 2,817 acres, lying adjacent to the south shore of the Columbia River, along Lake Wallula. The Wanaket Wildlife Area is bisected from west to east by U.S. Highway 730. The legal description for the Wanaket is T5N, R28E, and portions of Sections 13, 23, 24, and T5N, R29E, and portions of Sections 16, 17, 18, 19, 20, and 21. The area consists primarily of sagebrush-dominated shrub/steppe habitats and emergent wetlands. The Wanaket Wildlife Area was established to compensate for wildlife habitat losses resulting from the construction of the McNary Hydroelectric facility on the Columbia River and was approved as a Columbia River Basin Wildlife Mitigation Project by BPA and the Northwest Power Planning

Council in 1993. Although the Area is managed for wildlife, waterfowl, and upland bird habitat, limited public access is allowed. Access is typically obtained to conduct hunting, Tribal plant gathering, and Tribal cultural and religious activities. The HID also maintains a ROW through the southwest portion of the Wanaket Wildlife Area to conduct operation and maintenance of the "O" canal and the "OA" lateral. In addition, BPA transmission lines transect the southern half of the Area, through the southwest quarter of Section 13, the northeast quarter of Section 24, and the north half of Section 19 (CTUIR and BPA 2001b).

Land Use Policies

State and local authorizations that are required for various aspects of project construction and operation are listed in **Table 1.3-2**. Usually, before construction of an energy facility can occur in Oregon, the project must be approved by the EFSC by following standards to protect environmental resources under OAR Chapter 345, Division 22, Section 045. The proposed Wanapa Energy Center power plant is exempt from EFSC regulations due to location of the facility on tribal land (i.e., tribal sovereignty). However, certain ancillary facilities (e.g., the natural gas pipeline) *would* be subject to EFSC review. Construction of the natural gas supply/wastewater discharge pipelines would require county conditional use permits under the current zoning regulations.

3.9.1.2 Residential Areas

Using aerial photography interpretation and ground reconnaissance, structures (residences and outbuildings) were mapped onto a aerial photo base to determine the locations of structures within 0.5 mile of all project components. Structure locations are illustrated on **Figures 3.9-1 and 3.9-2**. The majority of the structures are located in a rural residential area located on both sides of Diagonal Road northeast of Hermiston; the housing development at McNary; residential and commercial developments on both sides of U.S. Highway 395 and Lind Road north of Hermiston, and scattered farmsteads adjacent to the existing Northwest interstate natural gas pipeline. In many locations, residences and farms are located adjacent to county roads where utilities (electrical lines, water lines) parallel the roadways.

3.9.1.3 Recreation

The major parks and recreational areas in the study area include the Wanaket Wildlife Area, McNary Beach State Park and Recreation Area, Hat Rock State Park, Cold Springs National Wildlife Refuge, and the Columbia River. These recreational areas and their uses are described below.

The only public access allowed on the Wanaket Wildlife Area is non-motorized access to conduct regulated hunting for waterfowl and upland birds. Part of the Wanaket Wildlife Area is flood-irrigated in the late spring/early summer to supplement naturally occurring wetlands and provide waterfowl brood rearing habitat for 11 waterfowl species. Irrigation also occurs in late summer/early fall periods to provide feeding and resting habitat for mallards, Canada geese, and 18 other waterfowl species using the Area during their migrations. Other habitat is managed for upland bird species (e.g., downy woodpecker, California quail, ringed-neck pheasant, western meadowlark, yellow warbler, swallows, and harrier), seven shorebird species, and for mammals (e.g., mule deer and mink). Hunting is permitted only after a daily drawing (i.e., day-of-hunt) on Wednesdays and weekends, with waterfowl hunting limited to 15 hunting parties (i.e., up to two people) for a total of 30 hunters. Thirty additional hunters are permitted to enter the Wanaket Wildlife Area in the afternoon through a second, upland bird hunt drawing. Big game hunting and the use of rifles or pistols is not permitted on the Area. No fishing is allowed on the Area (CTUIR and BPA 2001b).

McNary Beach Park is a 118-acre day-use park that is located on Lake Wallula at RM 293 on the Columbia River, below a steep bluff. The park is about 1.7 air miles northwest of the site, on Port of Umatilla Road about 3 miles east of Umatilla and 1 mile north of U.S. Highway 730. The park is administered by the USACE, at the McNary Lock and Dam, and features a swimming area, hiking trails, fishing, picnic tables, barbecue grills, drinking water, cold showers, flush toilets, and a pay phone. The park is open from dawn to dusk from Memorial Day to Labor Day weekend (USACE 2003).

Hat Rock State Park is a 735-acre day-use and boating park located on Lake Wallula at RM 298 on the Columbia River, surrounded by river bluffs. The park is located about 2.9 air miles east of the project site, on Hat Rock Road about 8.2 miles east of Umatilla and 0.8 mile north of U.S. Highway 730. This park is administered by the Oregon State Parks Department. It features a two-lane boat launch and handling dock, swimming area, hiking trails, fishing, horseshoe pits, picnic

tables, fire pits/barbecue grills, ponds with domestic ducks and geese, drinking water, flush and vault toilets, and a pay phone. The park is open year-round during daylight hours. Hat Rock Campground is a private campground located next to the park. The campground has a store, café, full recreational vehicle (RV) hookup sites (including sewer), RV and tent campsites with water and electricity, hot showers, phones, and a dump station (USACE 2003).

The USFWS Cold Springs National Wildlife Refuge is a day-use park that comprises 3,112 acres and is located about 4.6 air miles to the southeast of the project site, 6 miles east/northeast of Hermiston, and 8 miles north/northeast of Stanfield. This refuge was established by President Theodore Roosevelt on February 25, 1909, as a "preserve and breeding ground for native birds." It includes the tree-lined Cold Springs Reservoir with mixed habitats that provide recreational opportunities for fishing, wildlife viewing, photography, hiking, horseback riding, bicycling, non-motorized boating, boats with electric motors, and hunting during the pheasant/quail and waterfowl (geese, ducks, coot, and snipe) seasons. The reservoir serves as the primary water source for irrigation of area croplands and its water levels are regulated by the BOR. As an irrigation reservoir, the water levels change significantly throughout the year, from 1,550 acres of open water in May when the reservoir is full down to 200 acres of open water after the irrigation season in late August. The northern portion of the Refuge (approximately two-thirds) is closed year-round to public access, the northern portion of the reservoir also is closed from October 1 through February 28/29, and the southern part of the Refuge and reservoir (approximately one-third) is open year-round. The Refuge has six designated parking areas and two car-top boat launch sites that are open from March 1 through September 30. The Refuge is only open for daytime recreational use, from 5:00 a.m. until 1.5 hours after sunset (USFWS nd).

Recreational boating, swimming, fishing, and windsurfing occur elsewhere along on the Columbia River (Lake Wallula), about 0.2 mile north of the project site at RM 295 and stretching westward and eastward. However, the project site would be about 80 air miles east of and not seen from the Columbia River Gorge National Scenic Area.

The Farm City Pro Rodeo is held annually for 5 days in August, in conjunction with the Umatilla County Fair. This is a nationally recognized professional rodeo, attracting participants and visitors from throughout the U.S.

3.9.2 Environmental Consequences and Mitigation

3.9.2.1 Land Use

The power plant site would convert 47 out of 195 acres from grassland-steppe habitat to an industrial facility for the life of the project. Because the power plant site is located on Tribal Trust Land, managed by the CTUIR, it is not zoned. However, the alternative electrical transmission line and pipeline routes cross various types of city and county zoning and comprehensive land use designations. Although the project may require some zoning changes or variances under the applicable city and county regulations, it would not require a zoning change under the state site certificate approval process.

Easements would be obtained from the landowners for the proposed water line, the natural gas pipeline and water discharge line, and the proposed transmission line ROW. The new 17,684-foot (3.35-mile) water pipeline corridor would parallel existing roads from the Port of Umatilla to the Wanapa Energy Center.

The proposed natural gas supply/wastewater discharge pipelines route would be about 52,362 feet (9.92 miles) long. The route would traverse south from the project site until it reached U.S. Highway 730, follow on the north side of U.S. Highway 730 traversing southeast for 0.3 mile, cross U.S. Highway 730 and traverse south until reaching West Progress Road, follow on the north side of West Progress Road and traverse east for 1.4 miles, traverse southward until reaching the Northwest Natural Gas Pipeline ROW, and then follow that ROW southeast until reaching the PGT pipeline. ***This route would cross 3 major active irrigation canals that are managed by Reclamation or local irrigation districts.***

The proposed transmission line ROW would be about 23,450 feet (4.44 miles) long. The route would traverse southwest from the project site, cross U.S. Highway 730, parallel an existing BPA ROW and go west/northwest, and then follow next to another existing BPA ROW north.

Table 3.9-1 generally summarizes the current types of land use that would be occupied or crossed by each of the project components of the Proposed Action, and thus the types of land use conversions that would occur.

Table 3.9-1
Types of Land Use Affected/Converted by the Proposed Action
(miles/acres¹)

| Type of Land Use | Access Road | Water Supply Line² | Natural Gas Supply/Plant Discharge Water Line | Electrical Line |
|----------------------------|--------------------|--------------------------------------|--|------------------------|
| Rural residential | | | 1.9 / 11.5 | >0.0 / 0.4 |
| Irrigated cropland | | | 7.1 / 43 | |
| Irrigated pasture | | | | 1.5 / 9.0 |
| Grassland-steppe (natural) | 0.9 / 5.5 | 1.7 / 10.3 | 2.1 / 24 | 2.2 / 13.3 |
| Commercial & residential | | | | |
| Industrial | 0.5 / 3.0 | 1.7 / 10.3 | | 0.5 / 3.0 |
| Highway | | | >0.0 / 0.4 | 0.1 / 0.6 |
| Railroad | | | 0.1 / 0.6 | |

¹ Acreage based on a 50-foot permanent ROW.

²Water supply line ROW would be utilized for potable water and sanitary sewer pipelines.

3.9.2.2 Residential Areas

Those most likely to be affected by the project are the residents living near the proposed natural gas supply/wastewater discharge pipeline and the electrical transmission line ROWs. An analysis of these two ROWs showed that 16 residences are located within 200 feet of the pipeline ROW and 8 residences are located within 300 feet of the proposed electrical transmission line. These residents would be most affected by construction noise, disruptions to traffic flow and access, and temporary to long-term visual impacts. To reduce these impacts, facilities would be located a minimum of 200 feet from the nearest residents. Landowners also would be notified at least 5 days before the start of construction on or near their land, unless earlier notification was requested in the easement negotiations. They would be notified of the construction plans and schedules that are to occur on their land. Fences then would be cut before clearing and grading to provide access for equipment. Any fence that required cutting would be braced and secured to prevent the slacking of wires. Temporary gates would be installed across openings to control livestock and to limit public access. At the end of construction, the site would be graded and restored, fences would be replaced,

and pipeline markers would be installed. When constructing in or near a roadway, one traffic lane would always remain open and private drives would remain accessible.

3.9.2.3 Recreation

No recreational activities would be displaced by the project. Temporary disruptions in access for recreational users might occur during construction, to assure safety while there are open trenches, disturbed lands, staged materials and supplies, and heavy equipment is operating.

Hunters would continue to be allowed to hunt on the Wanaket Wildlife Area, but their recreational experience would be affected by the noise and visual impacts of the facilities during construction and operation of the power plant. As indicated earlier, recreationists on the Columbia River, and possibly the Cold Springs National Wildlife Refuge, would be able to see the four 213-foot-tall exhaust stacks, the turbine building, and possibly other parts of the facility. They would experience a significant change in the aesthetic quality of the area, from a natural grassland-steppe area, characteristic of the bluffs above and along the Columbia River, to an industrial facility. Recreational users of McNary Beach State Park and Recreation Area and Hat Rock State Park should not be affected by the project because of the 150-foot-high bluff that would screen them from the project.

3.9.3 *Proposed Action Impact Summary*

3.9.3.1 Land Use

Construction of the project components would occur on Tribal Trust Land and private land varying land uses. The power plant would convert 47 acres of grassland-steppe habitat to an industrial site. The other project components would occur on land used for rural residential, agriculture, grassland- and shrub-steppe, industrial, highway ROW, and railroad ROW. Construction noise and dust would be experienced for less than 1 month at over 16 residences located within 200 feet of the gas supply/water discharge pipeline ROW centerline and also at 8 residences within 300 feet of the electric transmission line ROW centerline.

3.9.3.2 Recreation

Project construction and operation would not displace recreational users in the Wanaket Wildlife Area, McNary Beach State Park and Recreation Area, Hat Rock State Park, Cold Springs National Wildlife Refuge, or Columbia River. However, increased traffic, visual, and noise could affect the recreational experience in the Wanaket Wildlife Area, but not in a manner that would change future use. Recreational users of the McNary Beach State Park and Recreation Area and Hat Rock State Park would not be affected because of visual screening by a bluff.

3.9.4 Component Alternatives Impact Summaries

The primary land use effects from construction and operation of the gas supply and plant discharge water pipelines and transmission lines would be: 1) short-term increases in noise, fugitive dust, and traffic delays associated with pipeline and transmission line construction in the vicinity of residences between the plant site and Stanfield; and 2) the commitment of private and public lands to long-term utility uses. Alternative comparisons of these factors are presented in Tables 3.9-2, 3.9-3, and 3.9-4.

None of the alternative gas supply pipelines, electrical transmission lines, or plant discharge water pipeline routes would cross developed recreational areas, recreational trails, or other special management areas with the exception of Cold Springs National Wildlife Refuge. The proposed and alternative plant discharge water pipeline routes (Alternatives 1 through 6) would be located parallel to the Feed Canal where the pipeline crosses the Refuge. The Feed Canal road is not part of the public road system. The underground pipeline would not reduce access, or interfere with current recreational uses of the refuge and reservoir.

Table 3.9-2
Natural Gas Supply/Plant Discharge Water Pipeline Route Alternatives Comparison – Land Use

| Resource/Impact Issue | Alternatives | | | | | | | |
|---|---|---|---|--|---|---|---|---|
| | No Action | Proposed Action (Figure 2.3-1) | 1 (Figure 2.4-1) | 2 (Figure 2.4-2) | 3 (Figure 2.4-3) | 4 (Figure 2.4-4) | 5 (Figure 2.4-5) | 6 (Figure 2.4-6) |
| Land Use | | | | | | | | |
| Temporary Disturbance | No impact | Approximately 128 acres would be disturbed during construction. | Approximately 131 acres would be disturbed during construction. | Approximately 133 acres would be disturbed during construction. | Approximately 129 acres would be disturbed during construction. | Approximately 122 acres would be disturbed during construction. | Approximately 97 acres would be disturbed during construction. | Approximately 107 acres would be disturbed during construction. |
| Long-term land commitment to utility uses | No impact | Approximately 60 acres would be used as the ROW easement. | Approximately 62 acres would be used as the ROW easement. | Approximately 62 acres would be used as the ROW easement. | Approximately 61 acres would be used as the ROW easement. | Approximately 58 acres would be used as the ROW easement. | | |
| Residences/Land Use | No residences would be affected by construction, and existing land uses would continue. | 16 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on large land parcels associated with farms. Pipeline ROW is located primarily in irrigated cropland where special efforts would be required to maintain the drainage pattern and soil productivity. | 12 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on large land parcels associated with farms. Pipeline ROW is located primarily in irrigated cropland where special efforts would be required to maintain the drainage pattern and soil productivity. | 43 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on small rural residential lots, with many small outbuildings and fences on the existing Northwest Pipeline ROW that would have to be cleared and restored. The proposed alignment is located in and adjacent to county roads that could cause traffic delays, and require detours. | 12 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on large land parcels associated with farms. Pipeline ROW is located primarily in irrigated cropland where special efforts would be required to maintain the drainage pattern and soil productivity. | 14 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on large land parcels associated with farms. Pipeline ROW is located primarily in irrigated cropland where special efforts would be required to maintain the drainage pattern and soil productivity. | 16 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on large land parcels associated with farms. Pipeline ROW is located primarily in irrigated cropland where special efforts would be required to maintain the drainage pattern and soil productivity. | 12 residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction. The majority of these structures are on large land parcels associated with farms. Pipeline ROW is located primarily in irrigated cropland where special efforts would be required to maintain the drainage pattern and soil productivity. |

Table 3.9-3
Electric Transmission Line Alternatives Comparison – Land Use

| Resource/Impact Issue | Alternatives | | | | |
|-----------------------|--------------|---|---|--|--|
| | No Action | Proposed Action (Figure 2.3-1) | 1 (Figure 2.4-7) | 2 (Figure 2.4-8) | 3 (Figure 2.4-10) |
| Land Use | | | | | |
| Temporary Disturbance | No impact | Approximately 101 acres would be disturbed during construction. | Approximately 116 acres would be disturbed during construction. | Approximately 92 acres would be disturbed during construction. | Approximately 92 acres would be disturbed during construction. |

Table 3.9-4
Plant Discharge Location Alternatives Comparison – Land Use

| | No Action | Proposed Action (Figure 2.3-1) | Alternative 1 (Figure 2.4-11) |
|---|---|---|--|
| Resource/Impact Issue | | | |
| Land Use: Residences/ Agricultural productivity/ Recreation | No residences would be affected by construction, and existing land uses would continue. | One residential structure is located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during plant discharge water pipeline construction between the natural gas supply pipeline ROW and Cold Springs Reservoir. The remainder of the surface disturbance for the plant discharge water pipeline is included in the ROW for the gas supply pipeline, which is the same for both alternatives. No change in access to recreational users of Cold Springs Reservoir would occur because the Feed Canal service road is not part of the public road access system. | No residential structures are located within 200 feet of the ROW centerline that would be subject to short-term noise and dust during construction between the plant site and the Columbia River. No change in access to recreational users of Lake Wallula would occur because the proposed plant discharge is not located near any designated recreational areas, or public access points. |

3.10 Socioeconomics

3.10.1 *Affected Environment*

The study area for the socioeconomic analysis includes Umatilla County, where the project would be located, and the nearby surrounding cities of Hermiston, Umatilla, and Stanfield where potential impacts are most likely to occur. Information specific to the CTUIR population is located in Section 3.10.1.5. Information also is provided for Morrow County, located west of Umatilla County, where additional work force members are likely to originate from and for the State of Oregon for comparative purposes.

3.10.1.1 Population and Environmental Justice

Umatilla County had a population of over 70,500 people in 2000 (see **Table 3.10-1**). This represented a moderate average annual increase of 1.9 percent from the 59,200 people living in the county in 1990, and that growth rate was similar to the state annual average increase of 2.0 percent. In contrast, the cities of Hermiston, Umatilla, and Stanfield experienced significant average annual growth since 1990. In 2000, Hermiston had 13,400 people with 3.4 percent annual growth, Umatilla had nearly 5,000 people with 7.2 percent annual growth, and Stanfield had nearly 2,000 people with 2.6 percent average annual growth (U.S. Bureau of the Census 2002, 1992).

Table 3.10-1
General Population Characteristics - 1990 and 2000

| Jurisdiction | Population | | 1990-2000 Change | |
|-----------------|------------|-----------|------------------|--------------|
| | 1990 | 2000 | Number | Ave Annual % |
| Hermiston | 10,040 | 13,417 | 3,377 | 3.4 |
| Stanfield | 1,567 | 1,971 | 404 | 2.6 |
| Umatilla | 2,870 | 4,946 | 2,076 | 7.2 |
| Pendleton | 15,127 | 16,262 | 1,135 | 0.8 |
| Umatilla County | 59,249 | 70,548 | 11,299 | 1.9 |
| | | | | |
| Morrow County | 7,625 | 10,995 | 3,370 | 4.4 |
| | | | | |
| Oregon | 2,842,321 | 3,421,399 | 579,078 | 2.0 |

Sources: U.S. Bureau of the Census 2002, 1992.

Environmental justice is the evaluation of potential disproportionate impacts to minority and low-income populations. Umatilla and Morrow counties had greater proportions of minority populations in 2000 (18 percent and 25 percent, respectively) than the State of Oregon (13.6 percent, see **Table 3.10-2**). Similarly, minority populations made up 20.9 percent of Hermiston, 30.6 percent of Umatilla, and 31.1 percent of Stanfield in 2000, all substantially greater than the proportion of minorities found in the State. *The largest single minority group specified in the Census was American Indian and Alaskan natives. All other minority groups, including Hispanics, were* categorized as “other” by the Census. Hermiston also had a relatively large Asian population. Poverty levels can be used as a measure of low-income populations. In all jurisdictions, the percentage of the population living below the poverty level was somewhat to significantly greater than the 11.6 percent in the State overall. The greatest percentage occurred in Umatilla where 19.4 percent of the population had incomes below the poverty level (U.S. Bureau of the Census 2002).

3.10.1.2 Housing

Umatilla County had more than 27,600 housing units in 2000, of which nearly 2,500 or 9.0 percent were vacant (see **Table 3.10-3**). There were 760 units available for rent year-round and 790 units available on a seasonal basis. Morrow County had an additional 500 vacant units available for rent, with 126 available for rent year-round and 233 units available seasonally. Median gross rent was \$481 per month in Umatilla County and \$473 per month in Morrow County, substantially less than the \$620 per month rent for Oregon, overall (U.S. Bureau of the Census 2002). In addition, there are a number of hotel and motel rooms available within Umatilla County and the surrounding cities. In 2000, the Oregon Lodging Association estimated that Umatilla County had a total of 1,726 rooms available for rent in hotels, motels, bed and breakfasts, and resorts in the area (BPA 2001). **Table 3.10-4** summarizes the four hotels/motels located in Hermiston and Umatilla.

3.10.1.3 Employment, Economics, and Fiscal/Taxes

The principal industries in Umatilla County include agriculture, food processing, and forest/wood products. Additional major contributors to the economy include tourism, manufacturing, recreation, aggregate production, and power generation. Overall retail sales in the county were \$567.2 million in 1997 (U.S. Bureau of the Census 2002). The three primary agricultural products in the county, as represented by the largest gross farm sales, are vegetable crops, field crops, and

Table 3.10-2
Environmental Justice Characteristics - 2000

| Jurisdiction | Population | Race | | | | | | | | | | | | Below Poverty | |
|--------------------|------------|-----------------|------|-----------------|-----|-------------------------------------|-----|-----------------|-----|---|-----|-----------------|------|---------------|------|
| | | White Number | % | Black Number | % | Am Indian & Alaskan Number | % | Asian Number | % | Hawaiian & Pacific Isl. Number | % | Other Number | % | Number | % |
| Hermiston | 13,417 | 10,618 | 79.1 | 122 | 0.9 | 122 | 0.9 | 259 | 1.9 | 24 | 0.2 | 2,039 | 15.2 | 1,655 | 12.4 |
| Stanfield | 1,971 | 1,359 | 68.9 | 6 | 0.3 | 15 | 0.8 | 14 | 0.7 | 0 | 0.0 | 503 | 25.5 | 279 | 14.2 |
| Umatilla | 4,946 | 3,432 | 69.4 | 206 | 4.2 | 35 | 0.7 | 13 | 0.3 | 0 | 0.0 | 1,188 | 24.0 | 817 | 19.4 |
| Pendleton | 16,262 | 14,393 | 88.5 | 322 | 2.0 | 422 | 2.6 | 66 | 0.4 | 11 | 0.1 | 657 | 4.0 | 1,910 | 13.3 |
| Umatilla County | 70,548 | 57,873 | 82.0 | 707 | 1.0 | 2,225 | 3.2 | 492 | 0.7 | 62 | 0.1 | 7,679 | 10.9 | 8,524 | 12.7 |
| Morrow County | 10,995 | 8,242 | 75.0 | 17 | 0.2 | 182 | 1.7 | 56 | 0.5 | 3 | 0.0 | 2,216 | 20.2 | 1,617 | 14.8 |
| Oregon | 3,421,399 | 2,957,510 | 86.4 | 53,032 | 1.6 | 43,434 | 1.3 | 99,136 | 2.9 | 7,583 | 0.2 | 146,837 | 4.3 | 388,740 | 11.6 |

Source: U.S. Bureau of the Census 2002.

Table 3.10-3
Housing Characteristics - 2000

| Jurisdiction | Total Units | Occupied | Vacant | | | | Median Gross Rent |
|---------------------|--------------------|-----------------|---------------------|----------------|------------------------|------------------------|--------------------------|
| | | | Total Number | Percent | For Rent Number | Seasonal Number | |
| Hermiston | 5,421 | 5,047 | 374 | 6.9 | 226 | 21 | \$488 |
| Stanfield | 699 | 648 | 51 | 7.3 | 31 | 0 | \$504 |
| Umatilla | 1,515 | 1,378 | 137 | 9.0 | 89 | 12 | \$512 |
| Pendleton | 6,341 | 5,945 | 396 | 6.2 | 198 | 71 | \$448 |
| Umatilla County | 27,676 | 25,195 | 2,481 | 9.0 | 760 | 790 | \$481 |
| | | | | | | | |
| Morrow County | 4,276 | 3,776 | 500 | 11.7 | 126 | 233 | \$473 |
| | | | | | | | |
| Oregon | 1,452,709 | 1,333,723 | 118,986 | 8.2 | 38,901 | 39,629 | \$620 |

Source: U.S. Bureau of the Census 2002.

Table 3.10-4
Hotels and Motels in Hermiston and Umatilla

| Hotel/Motel | Location | Rooms |
|----------------------------|--|--------------|
| Best Western Hermiston Inn | 2255 U.S. Highway 395 South, Hermiston | 54 |
| Oak Tree Inn | 1110 SE 4th Street, Hermiston | 62 |
| Oxford Inn | 655 North 1 Street, Hermiston | 87 |
| Oxford Suites | 1050 North 1 Street, Hermiston | 127 |
| Tillicum Motor Inn | 1481 6th Street, Umatilla | 40 |
| Total | | 370 |

cattle and calves. There are a total of 97 manufacturing facilities in the county, of which 27 are located within Hermiston (Oregon Employment Department 1998; Oregon State University Extension Economic Information Office; and Hermiston City Administration, as cited by the Oregon Economic & Community Development Department 2003).

As shown in **Table 3.10-5**, in 1999 nearly 33,600 people comprised the civilian labor force (age 16 years and older) in Umatilla County with about 7.5 percent of that work force (2,530 people) unemployed that year. The primary employment sectors included services (35.9 percent), retail trade (13.9 percent), and manufacturing (12.8 percent). In comparison, Oregon State's primary employment sectors were services (41.3 percent), manufacturing (14.4 percent), and retail trade (12.5 percent) (U.S. Bureau of the Census 2002).

Table 3.10-5
Employment Characteristics, Persons 16 Years and Over - 1999

| Status/Industry | Umatilla County | | Hermiston | | Oregon |
|--|-----------------|---------|-----------|---------|---------|
| | Number | Percent | Number | Percent | Percent |
| Status In Labor Force: | | | | | |
| Civilian | 33,598 | | 6,672 | | |
| Employed | 31,068 | 92.5 | 6,155 | 92.3 | 93.5 |
| Unemployed | 2,530 | 7.5 | 517 | 7.7 | 6.5 |
| Armed Forces | 23 | 0.1 | 0 | 0.0 | |
| Industry: | | | | | |
| Agriculture, Forestry, Fisheries, and Mining | 2,358 | 7.6 | 368 | 6.0 | 3.2 |
| Construction | 2,109 | 6.8 | 350 | 5.7 | 6.9 |
| Manufacturing | 3,976 | 12.8 | 673 | 10.9 | 14.4 |
| Transportation, Warehousing, and Other Util. | 2,121 | 6.8 | 574 | 9.3 | 4.7 |
| Information | 462 | 1.5 | 78 | 1.3 | 2.4 |
| Wholesale Trade | 925 | 3.0 | 226 | 3.7 | 4.1 |
| Retail Trade | 4,328 | 13.9 | 1,066 | 17.3 | 12.5 |
| Finance, Insurance, and Real Estate | 1,073 | 3.5 | 273 | 4.4 | 6.1 |
| Services | 11,147 | 35.9 | 2,113 | 34.3 | 41.3 |
| Public Administration | 2,569 | 8.3 | 434 | 7.1 | 4.4 |
| Total | 31,068 | 100.0 | 6,155 | 100.0 | 100.0 |

Source: U.S. Bureau of the Census 2002.

In Hermiston, nearly 6,700 people comprised the civilian labor force (age 16 years and older) with about 7.7 percent of that work force (517 people) unemployed that year. Similar to Umatilla County overall, the primary employment sectors in Hermiston included services (34.3 percent), retail trade (17.3 percent), and manufacturing (10.9 percent) (U.S. Bureau of the Census 2002). The five largest employers in Hermiston are summarized in **Table 3.10-6**.

Table 3.10-6
Five Largest Employers in the City of Hermiston

| Company | Product/Service | Number of Employees |
|----------------------|------------------------|----------------------------|
| Wal-Mart | Distribution facility | 1,000 |
| JR Simplot | Food products | 850 |
| Lamb-Weston, Inc. | French fries | 500 |
| Marlette Homes, Inc. | Manufactured homes | 460 |
| Hermiston Foods | Frozen foods | 450 |

Source: Hermiston City Administration, as cited by the Oregon Economic & Community Development Department 2003.

As shown in **Table 3.10-7**, all of the jurisdictions in the study area had somewhat to significantly lower median household, median family, and per capita income levels in 1999 than for the State, overall. Umatilla County had a median household income of \$39,249 compared to \$40,916 for the State, a median family income of \$41,850 compared to \$48,680 for the State, and a per capita income of \$16,410 compared to \$20,940 for the State of Oregon (U.S. Bureau of the Census 2002).

There is no general sales tax levied in Oregon. Property taxes are assessed using permanent rates set for all taxing districts in fiscal year 1997-1998. The tax rates cannot exceed \$15 per \$1,000 of real market value. Construction occurring since July 1, 1995, is valued at the average rate of similar properties in the area, and is limited to a 3-percent annual growth rate. The total assessed value of property in Umatilla County was \$3.760 billion in 2000 and \$3.627 billion in 1999. Corporations conducting or authorized to conduct business in the state pay an Oregon excise tax, and corporations not conducting or authorized to conduct business in the state but having income from Oregon are required to pay an Oregon income tax. Employers in the state also are required to pay unemployment insurance. New employers as of 2002 are required to pay a fixed rate of 3 percent of the taxable wage base. Investor-owned utilities operating within the state also are required to pay an annual fee, based on 0.25 percent of gross operating revenues. Finally, other fees that represent sources of revenue for the state, county, or city include motor vehicle licensing, driver licensing, fuels, hunting and fishing licenses, hotel-motel, and emergency communications (911) taxes and fees (Oregon Economic & Community Development Department 2003).

Table 3.10-7
Income Characteristics - 1989 and 1999

| Jurisdiction | Median Household | | | Median Family | | | Per Capita | | |
|---------------------|-------------------------|-------------|---------------------|----------------------|-------------|---------------------|-------------------|-------------|---------------------|
| | 1989 | 1999 | Ave Annual % | 1989 | 1999 | Ave Annual % | 1989 | 1999 | Ave Annual % |
| Hermiston | \$20,674 | \$35,354 | 7.1 | \$25,501 | \$42,881 | 6.8 | \$9,729 | \$17,075 | 7.6 |
| Stanfield | \$23,564 | \$35,286 | 5.0 | \$24,449 | \$38,145 | 5.6 | \$8,815 | \$12,842 | 4.6 |
| Umatilla | \$20,799 | \$33,844 | 6.3 | \$21,976 | \$32,969 | 5.0 | \$8,481 | \$11,469 | 3.5 |
| Umatilla County | \$22,791 | \$36,249 | 5.9 | \$27,459 | \$41,850 | 5.2 | \$11,178 | \$16,410 | 4.7 |
| | | | | | | | | | |
| Morrow County | \$23,969 | \$37,521 | 5.7 | \$26,825 | \$40,731 | 5.2 | \$10,412 | \$15,802 | 5.2 |
| | | | | | | | | | |
| Oregon | \$27,250 | \$40,916 | 5.0 | \$32,336 | \$48,680 | 5.1 | \$13,418 | \$20,940 | 5.6 |

Sources: U.S. Bureau of the Census 2002 and 1992.

Table 3.10-8 summarizes Umatilla County's budget for fiscal year 2004. The total budget was almost \$48.5 million. Sources of revenue included almost \$21.3 million in various revenues (e.g., unrestricted funds, beginning balances, and transfers into the account), almost \$7.4 million from local funds, over \$18.8 million in state funds, and \$972,000 in federal funds. (Umatilla County 2003).

Table 3.10-8
Umatilla County Fiscal Year 2004 Budget

| Fund/ Department | Local Revenue | State Revenue | Federal Revenue | Other Revenue | Expenditure |
|-------------------------|----------------------|----------------------|------------------------|----------------------|---------------------|
| General | \$1,953,985 | \$2,122,123 | \$41,900 | \$12,925,079 | \$17,043,087 |
| Special Revenue | 3,238,895 | 4,899,859 | 278,606 | 3,080,009 | 11,497,369 |
| Road | 180,500 | 3,347,000 | 651,000 | 1,909,777 | 6,088,277 |
| Children & Families | 8,800 | 749,122 | 0 | 397,222 | 1,155,144 |
| Mental Health | 877,600 | 7,742,580 | 0 | 1,623,357 | 10,243,537 |
| Capital Projects | 1,000 | 0 | 0 | 539,902 | 540,902 |
| Other Requirements | 1,126,884 | 0 | 0 | 790,000 | 1,916,884 |
| Total | \$7,387,664 | \$18,860,684 | \$971,506 | \$21,265,346 | \$48,485,200 |

Source: Umatilla County 2003.

Tables 3.10-9 and **3.10-10** summarize the City Hermiston's budget for 2001-2002. Total revenues were over \$31.0 million and total expenditures were over \$29.0 million. The greatest sources of revenue were non-revenue receipts, cash forward, and energy services. Major capital costs now or in the near future include completion of the system capital acquisition costs for Hermiston Energy Services (a new municipal energy utility), construction of a new community pool at Butte Park (an estimated total of up to \$3.64 million), and improvements to the wastewater treatment plant (an estimated total of up to \$8.7 million over several years). In the 1996-1997 budget, the City of Hermiston had \$370,267,000 in assessed property value. Total taxes of \$25.28 per \$1,000 in property value were assessed that year, including \$6.52/\$1,000 for the city, \$15.68/\$1,000 for the school district, and \$3.08/\$1,000 value for other taxing districts.

3.10.1.4 Public Services and Utilities

The Hermiston Fire and Emergency Services District provides fire prevention, fire suppression, emergency medical services, and hazardous materials response to the City of Hermiston and to

Table 3.10-9
City of Hermiston 2001-02 Budget Revenues and Expenditures

| Fund | Revenues | Expenditures |
|-------------------|---------------------|---------------------|
| Bonded Debt | \$1,539,408 | \$1,430,700 |
| Bancroft Bond | 0 | 0 |
| General Fund | 5,852,800 | 4,847,174 |
| State Tax Street | 574,843 | 574,843 |
| Transient Room | 116,439 | 46,223 |
| Utility | 3,123,670 | 2,662,108 |
| Regional Water | 1,051,470 | 680,052 |
| Revolving Loan | 251,949 | |
| Energy Services | 15,242,763 | 14,708,121 |
| Pool Construction | 0 | 0 |
| Reserve | 3,273,409 | 4,110,627 |
| Total | \$31,026,751 | \$29,059,848 |

Source: City of Hermiston 2003b.

Table 3.10-10
City of Hermiston 2001-02 Sources of Revenues

| Revenue Source | Revenues |
|---------------------------|---------------------|
| Property Taxes | \$2,351,395 |
| Local Assessments | 75,140 |
| License & Franchise | 561,400 |
| Fines & Penalties | 90,000 |
| Use of City Money | 347,600 |
| From other Agencies | 1,520,170 |
| Service Charges | 520,720 |
| Non-Revenue Receipt | 11,115,000 |
| Miscellaneous Revenues | 230,000 |
| Sewer Service | 1,070,000 |
| Water Service | 1,826,500 |
| Energy Service | 5,374,000 |
| Transfer from Other Funds | 1,619,395 |
| Cash Forward | 5,775,870 |
| Total | \$32,477,190 |

Source: City of Hermiston 2003b.

northwestern Umatilla County. The District provides fire services to a 135-square-mile area and ambulance services to a 500-square-mile area. In addition, the District has mutual-aid agreements with five neighboring fire departments. The District has 21 paid and 30 volunteer personnel staffing its three fire stations and equipment:

Stations

- Station 1 – the headquarters and primary station at the Public Safety Center at 330 S. First Street
- Station 2 – at Diagonal Boulevard and Craig Road
- Station 3 – at Westland Road

Equipment

- 3 light fire attack engines
- 4 full-size fire attack engines
- 1, 75-foot Quint Aerial Ladder
- 1 rescue engine
- 3 water tenders
- 4 ambulances
- 5 hazardous materials response assets
- 3 staff vehicles
- 1 parade engine

The district had an Insurance Services Organization rating of 4. **Table 3.10-11** provides a summary of the District's fire responses in 2001 (City of Hermiston 2003).

Medical services are provided by the Good Shepherd Medical Center in Hermiston. This is a 48-bed facility that provides complete medical/surgical, ob/gyn, critical care, surgery services, and ambulance services. The Center has a Trauma Level 3 Emergency Room that is open 24 hours a day. It has over 30 physicians and 400 employees. The Center, as part of the Good Shepherd Health Care System, is affiliated with TLC Home Health, Vange John Memorial Hospice, Good Shepherd Clinic Pharmacy, Good Shepherd Medical Group, and the Cascade East Health Plans (Good Shepherd Health Care System 2003).

Table 3.10-11
Hermiston Fire and Emergency Services District Fire Responses - 2001

| Type of Response | Number of Responses |
|-------------------------------|----------------------------|
| Structure fires | 189 |
| Vehicle fires | 23 |
| Natural cover fires | 122 |
| False alarms | 96 |
| Hazardous materials responses | 5 |
| Rescue | 11 |
| Mutual-aid | 3 |
| Other types of responses | 170 |
| Total | 619 |

Source: City of Hermiston 2003.

Law enforcement services are provided by the Hermiston Police Department, the Umatilla County Sheriff's Department, the Oregon State Patrol, and by other local municipal police departments. The Hermiston Police Department is housed in the Public Safety Center at 330 South First Street in Hermiston. The department has a total of 42 staff, including 8 dispatchers, 1 dispatch supervisor, 17 police officers, 9 reserve officers, 4 sergeants, 1 lieutenant, 1 chief, 0.5 nuisance abatement staff, and 0.5 administrative assistant (City of Hermiston 2003).

The Umatilla County Sheriff Department's Criminal/Patrol Division has 12 sworn deputies. Nine of those deputies are assigned to criminal investigations and patrol duties, two are assigned to the domestic violence investigation unit, and one is assigned to the drug task force. The department's Corrections Division/Jail includes the Umatilla County Correctional Facility, a 250-bed jail in Pendleton. The department's Communication Division includes the Umatilla County Dispatch Center, which provides emergency 911 and non-emergency services to a number of cities (including Stanfield) and unincorporated areas in the county. The center receives over 7,500 calls annually (Umatilla County Sheriff's Department 2003).

In addition to the law enforcement services in the project study area and within Umatilla County, TRCI is located outside of the Umatilla city limits, on Beach Access Road about 1.5 miles west of the project site. The facility is designed to hold about 1,550 medium custody male inmates. As of November 2002, the facility housed 1,452 inmates. Although it is a medium custody facility, more

violent offenders have been housed there. The facility is staffed by about 250 correctional officers, corporals, and sergeants and about 100 non-custody support staff (American Federation of State, County, and Municipal Employees 2003; Oregon Department of Corrections 2002).

The project site does not currently have electrical, natural gas, water, wastewater, or telecommunications services. Electrical service to the surrounding area is provided by the Umatilla Electric Cooperative and natural gas is provided by Cascade Natural Gas. Water is supplied to the region by the Port of Umatilla from a pumping station at RM 293 on the Columbia River. The City of Hermiston obtains water from deep and shallow wells, a surface water intake on the Columbia River and a regional water treatment facility (part of the Port of Umatilla regional water supply system), pump and booster pump stations, storage tanks, and reservoirs. Wastewater collection and treatment is conducted by the City of Hermiston, with a 2.94-MGD capacity system being used at less than half its capacity at 1.2 MGD. Telecommunication services in Hermiston are provided by U.S. West and E.O. Telecom, and cable television service is provided by Charter Cable (City of Hermiston 2003).

3.10.1.5 CTUIR Demographics and Socioeconomic Issues

The total CTUIR Reservation population grew 72 percent between 1960 and 2000 while the Tribal population grew by 131 percent in the same time period. Both populations have seen significant increases in the last decade after several decades of general decline. Based on the demographic statistics below (**Table 3.10-12**), 36 percent of the Tribal population on the Reservation was 20 years old or younger.

Between 1990 and 2000, the unemployment rate for the Tribal population on the Reservation declined from 32 percent to 11 percent. Much of this decline can be attributed to the growth in Tribal government and enterprises such as the Wildhorse Resort and Casino. The per capita income of Indians on the Reservation has more than doubled since 1990 and has grown to 73 percent of the county per capita income.

The poverty rate among Tribal members on the Reservation dropped from 35 percent to 23 percent during the 1990-2000 time period. The 2000 poverty rate is twice the statewide poverty rate and 10 percent higher than the county wide rate.

Table 3.10-12
Demographic Statistics

| Age Class | Number in Age Class | Percentage of Total |
|------------------|----------------------------|----------------------------|
| 0-10 | 441 | 18 |
| 11-20 | 440 | 18 |
| 21-30 | 363 | 15 |
| 31-40 | 340 | 14 |
| 41-50 | 370 | 15 |
| 51-60 | 200 | 8 |
| 61-70 | 127 | 5 |
| 71-80 | 89 | 4 |
| 81-90 | 32 | 1 |
| 91 or older | 1 | Less than 1 |
| Total | 2,404 | |

Data provided by CTUIR, Department of Economic and Community Development.

The number of homes occupied by Indians on the Reservation has increased by 49 percent in the last decade, outpacing the total Indian population growth of 42 percent. Indian ownership on the Reservation has increased by 62 percent through an increase of 93 homes. Housing patterns on the Reservation are generally scattered site development on parcels ranging from 0.25 acre to hundreds of acres. Most of the population is concentrated in the Mission area where there is subsidized public housing. The number of homeowners on the Reservation that are paying more than 30 percent of their income for mortgage costs has increased from 11 percent to 16 percent in the last decade while the number of renters paying more than 30 percent has increased from 13 percent to 25 percent. This is indicative of a tight housing market and a community increasingly at risk of losing their homes.

3.10.2 *Environmental Consequences and Mitigation*

3.10.2.1 Population and Environmental Justice

No residents would be displaced as a result of construction of the project facilities. Construction activity on the project would vary throughout the 24- to 26-month construction period that would begin in *fourth quarter 2005*. It is estimated that the work force could include:

-
- Power plant – 100 to 600 workers through construction;
 - Natural gas pipeline – 80 workers over 3 months;
 - Water discharge pipeline – 20 workers over 3 months; and
 - Electrical transmission line – 120 workers over 4 months.

Management and specially skilled workers, possibly comprising 10 percent of the work force (i.e., maximum of 60 workers), would likely originate from throughout Washington, Oregon, or possibly remainder of the United States. These workers would most likely rent a hotel/motel room, apartment, or house relatively close to the project site (i.e., Hermiston, Umatilla, or Pendleton). As much as 30 percent of the construction work force (i.e., a maximum of 180 workers) could be hired locally from within Umatilla and Morrow counties. The 2,530 unemployed people in Umatilla County in 1999 indicates that an adequate local work force exists to fill these local jobs. The local workers would likely to remain at their existing residences and commute to the project construction sites on a daily basis. The remaining 60 percent (i.e., maximum of 360 workers) of the peak power plant work force would likely originate from outside of the study area, such as from the Tri-Cities area in Washington. These workers may elect to commute daily to the project site, or may rent a room during the work week and travel home for the weekends.

Assuming that each direct construction job generates an additional 0.3 indirect/secondary jobs (Weber and Howell 1982), an estimated 180 indirect jobs would be generated by the project during the peak construction period. These jobs would likely to be generated in the hotels/motels, restaurants, gas stations, and retail stores that would be providing additional services to the direct construction work force.

Although Umatilla County and its cities have a greater proportion of minorities and low-income people than the state, they would not be disproportionately negatively affected by the facilities because no residents would be displaced. However, because of their greater presence in the study area, they may benefit from the higher-paying maximum 180 direct construction jobs that would likely be generated by the project and up to 180 secondary jobs that could be generated.

The project would not cause impacts to Indian Trust Assets (Tribal cultural, traditional, and subsistence fishing in the Columbia River). The Wanapa Project is in discussions with CTUIR to reach an agreement regarding tribal employment at the Wanapa Energy Center.

3.10.2.2 Housing

As indicated earlier, there were an estimated 760 vacant units available for rent in Umatilla County, 126 units available in Morrow County, and an additional 1,726 hotel/motel rooms available to rent in Umatilla County (370 in Hermiston alone) in 2000. Thus, adequate housing would likely be available for the 60 to 420 maximum power plant workers that would be seeking temporary to long-term residences near the power plant site during construction.

The 30 operational employees would likely be partially hired from within the study area and the rest would move to Umatilla County with their families, if applicable. If all workers were hired from outside of the study area and there were an average of 2.6 people per household, a maximum of 78 people would in-migrate as a result of operation of the power plant. Because there is an adequate number of houses for sale, or the workers may decide to buy property and construct their own homes, no long-term impacts are likely to occur to local population levels or housing as a result of the operational work force.

3.10.2.3 Employment, Economics, and Fiscal/Taxes

One potential direct impact would be the temporary loss of crop production along the natural gas supply/wastewater discharge pipeline and electrical transmission line construction ROWs. The affected land would be taken out of production while these facilities are constructed. Although the disruption might last as little as one to several weeks, it might result in loss of an entire growing season. These landowners would be compensated for the lost income as part of the negotiated fees for the easements to cross their properties. Potential longer-term reductions in crop production also could occur as a result of compacted or disturbed topsoils. Best management construction practices would be used to separate and set aside topsoil during construction, replace it appropriately, and to till the soil to ensure that compaction is eliminated.

During construction, the project would have a positive impact by generating increased sales to local merchants and wholesalers from the purchase of local construction materials such as gravel, concrete, lumber, equipment, and other goods. Similarly, the construction work force expenditures within the study area also would have a positive impact, leading to increased business for local hotels and motels, restaurants, gas stations, and retail stores.

Since the power plant would be sited on land held in trust by the United States for the CTUIR, the beneficial owners, state and county taxation would not be applicable. However, the power plant would pay a tribal tax to the CTUIR, equivalent to the aggregate of State taxation. CTUIR would spend these tax revenues on goods and services mainly in Umatilla County, thereby directly introducing these revenues into the local economy. All project "tax advantages" are realized in the federal taxation scheme through a federal provision for accelerated depreciation for projects built on tribal land. Therefore, the power plant would introduce the same amount of revenues through taxation into the local and Oregon economies but the manner of introduction would be different. Any "tax breaks" would be at the federal level. Further, the power plant has committed to spend environmental mitigation funds in the local area. The power plant would pay for all local services used by the facility at rates negotiated with the local authorities. Because BPA buys easements from landowners for the placement of electrical transmission lines on private land, rather than being bought in fee, the land would remain in private ownership and would not be converted to tax exempt property. Thus, there would be no change in county or city tax revenues as a result of construction of the electrical transmission line. However, the natural gas supply/*plant* discharge *water* pipeline would be subjected to property taxes and would generate additional tax revenues for Umatilla County and the various jurisdictions to which property tax revenues are dispersed.

The 10-mile natural gas supply/*plant* discharge *water* pipelines for the project would be subjected to several annual taxes:

- County property tax - 1.5%, or \$15 per \$1,000 value
- Tax to the Oregon Department of Energy - less than 0.2%
- Gross operating revenue tax to the Oregon Public Utility Commission - 0.25%
- City franchise tax (if applicable) - about 3.0%

It is estimated that it would cost about \$10 million to construct the natural gas supply/*plant* discharge *water* pipelines. Based on this figure, an estimated \$150,000 in county property taxes and \$20,000 in Oregon Department of Energy taxes would be generated by the project on an annual basis. Gross operating revenues have not yet been estimated for the project.

As indicated above, during operation the plant also would provide 30 full-time jobs and an in-migrating population of up to 78 people. As with the construction work force, these workers would have a positive impact by generating additional revenues for local business from purchasing goods and services. The plant also would have a positive impact on the local economy by purchasing and

consuming about 10.2 million cubic feet of natural gas per hour. Other power plant purchases that are likely to occur include miscellaneous parts and supplies, aqueous ammonia for the air pollution control system, various treatment and laboratory chemicals, and diesel fuel.

3.10.2.4 Public Services and Utilities

A fire protection system meeting the Uniform Fire Code would be installed within the buildings and yard areas of the power plant site. The system would include a fire water system, dry chemical extinguishing system, a CO₂ extinguishing system, and portable fire extinguishers. Construction and operational work forces would be trained in the use of the equipment and fire suppression, and in first aid. When needed, the plant managers would call upon local and/or regional firefighting and emergency medical services to provide services.

The generating plant would use about **8 to 12** million gallons per day of water from the Port of Umatilla intake and pump facility and its existing water right. This would represent about **8 to 12** percent of the Port's 100.2 MGD water right. The Port would benefit from the additional revenue stream that would be created from selling this water to the project owners. The power plant minimizes water use by using a recirculating cooling system with mechanical draft evaporative cooling towers.

Plant discharge water would meet local permitting requirements and would be discharged into the end of the canal discharging into the Cold Springs Reservoir. This water would have a positive impact by supplementing the water flowing into the reservoir and later being used to irrigate farmlands. ***Domestic sewage*** generated at the power plant would be ***pipd to the City of Umatilla's sewage treatment plant***. ***Storm*** water would be collected and diverted to a retention pond with sufficient volume to hold the design storm event.

The generating plant would generate an estimated 1,200 cubic yards of waste annually. Recyclable materials would be separated from the wastes and taken to a recycler, and the remaining waste would be taken by a private contractor to a licensed disposal facility. Chemicals, lubricating oils and grease, and other similar wastes also would be taken by a private contractor to an approved hazardous materials disposal facility.

3.10.3 *Proposed Action Impact Summary*

Overall, the proposed project would result in beneficial impacts to socioeconomics. When combining all project components, construction activities would create a total of 320 to 820 temporary jobs during a 3- to 36-month period. An estimated 180 indirect/secondary jobs also would be generated during construction. Project operation would result in 30 permanent workers. Adequate housing would be available for the estimated work force numbers. Beneficial impacts also would occur from increased sales in the local area, additional tax revenues from the gas supply/water discharge pipeline ROW property taxes, and the purchase/use of additional natural gas. Since the power plant would be sited on land held in trust by the United States for the CTUIR, the beneficial owners, state and county taxation would not be applicable. However, the power plant would pay a tribal tax to the CTUIR, equivalent to the aggregate of State taxation. CTUIR would spend these tax revenues on goods and services mainly in Umatilla County, thereby directly introducing these revenues into the local economy. All project "tax advantages" are realized in the federal taxation scheme through a federal provision for accelerated depreciation for projects built on tribal land. Therefore, the power plant would introduce the same amount of revenues through taxation into the local and Oregon economies but the manner of introduction would be different. Any "tax breaks" would be at the federal level. Further, the power plant has committed to spend environmental mitigation funds in the local area. The power plant would pay for all local services used by the facility at rates negotiated with the local authorities. Potential adverse impacts would occur due to a temporary loss of crop production along the gas supply/water discharge pipelines and electric transmission line ROWs. Public utilities and services are available and would be used during plant operation. A fire protection system would be installed at the power plant site for fire control and protection. Local services would be available to handle solid wastes produced by the plant.

3.10.4 *Component Alternatives Impact Summaries*

Construction of the Proposed Action gas supply pipeline and plant discharge water pipeline routes would result in potential crop losses on 37 acres of prime farm land for 1 to 2 years. Construction of the pipelines along alternative routes would result in a range of prime farmland disturbance from 34 acres (Alternative 6) to 45 acres (Alternative 2).

The capital costs, and therefore, taxable value, of the Proposed Action gas supply pipeline and plant water discharge pipelines, and electrical transmission lines can be compared with the

components based on the length of the various facilities. The length of the Proposed Action gas supply/plant discharge water pipeline is 11.2 miles; the remaining alternatives range between 10.8 and 12 miles, a relatively small difference from the Proposed Action. The BPA proposed transmission line would not be subject to local property taxes. The taxable value of a plant discharge water pipeline from the plant site to Cold Springs Reservoir (about 7.5 miles on private, federal, and state lands) would be substantially greater than a 0.5 mile pipeline from the plant site to the Columbia River.

3.11 Public Health and Safety

3.11.1 Affected Environment

3.11.1.1 Power Plant Safety

Natural gas power plants have very good operating safety records. Because natural gas-fired power plants operate in a similar way to natural gas pipelines, the safety record for pipelines is indicative of that for power plants (see natural gas pipelines below). The risk of damage to power plant facilities from accidental and intentional damage from outside parties is very low because public access is not allowed onto fenced plant sites, and plant security can be staffed at levels appropriate to the potential outside threats, such as terrorism.

The Wanapa Energy Center is geographically isolated (approximately 1.2 miles) from the nearest occupied structure, which is the Two Rivers Correctional Facility.

3.11.1.2 Natural Gas Pipeline Safety

The transportation of natural gas involves inherent risk from the potential failure of the pipeline due to corrosion, installation problems, physical deformation, substrate movement or material wear. Pipeline operations are relatively safe and accidental releases are rare. There is a minor potential risk for explosion, fire or significant release of natural gas into the atmosphere.

Natural gas consumption in the U.S. has increased 21 percent since 1988 yet the number of injuries associated with pipeline accidents has declined 39 percent in the same period. This result has been attributed to better construction techniques, stricter safety precautions and stronger training programs. **Table 3.11-1** represents the risk probabilities for natural gas pipelines:

Table 3.11-1
Risk Probabilities for Natural Gas Pipelines
Average Probabilities Per Year (USDOT data – 1986 to 2002)

| | | | |
|---------------------------------|----------------------------------|----------------------------------|------------------------------------|
| Event probability per mile year | 0.00027 accidents per mile-year | 0.000045 injuries per mile-year | 0.000012 fatalities per mile-year |
| Equivalent probability | 2.7 accidents: 10,000 miles-year | 4.5 injuries: 100,000 miles-year | 1.2 fatalities: 100,000 miles-year |

The term “per mile-year” is equivalent to “each mile, each year.” For example, there would be an estimated 0.00027 accidents along any particular mile of pipe within a given year.

The majority of accidents involving natural gas pipelines are caused by damage from outside forces, primarily third-party damage and earth movement. Third-party damage is responsible for almost 50 percent of all reportable accidents on natural gas pipelines. Earth movements such as subsidence, frost heave, and landslides account for almost 3 percent of accidents.

3.11.1.3 Transmission Line Safety

Currently, there are several transmission lines in the vicinity of the proposed project that are associated with the McNary substation. The Lower Monumental-McNary No. 1 Line runs east and west and then turns north for approximately 1 mile before entering the substation. This north-south corridor also includes several other transmission lines including an existing DC line (see **Figure 2.3-7**). There are seven residences and buildings within four hundred feet of the existing transmission lines. The BPA McNary-John Day Transmission Project (BPA 2002) identified a number of environmental impacts and mitigation measures for the upgrade of the substation and associated transmission facilities. Part of the transmission route for the proposed project would utilize double-circuit structures that would be constructed with single-circuit lines; this would allow for future transmission capacity.

Transmission lines produce electric and magnetic fields whose strengths depend on line design and distance from the line. Field strengths diminish rapidly with distance from the line. There are no national guidelines or standards for electric fields from transmission lines except for the 5-milliamperere criterion for maximum permissible shock current from vehicles. Oregon also has a 9-kV/m limit on the maximum field under transmission lines. BPA designs new transmission lines to meet the 9-kV/m maximum on the transmission ROW and 5-kV/m maximum at the edge of the

ROW. Transmission lines can be a major source of magnetic field exposure for residences located close by. There are no national guidelines or standards for magnetic field exposure.

3.11.2 Environmental Consequences and Mitigation

3.11.2.1 Power Plant

The Wanapa Energy Center would be fueled by natural gas, which is delivered by pipeline. No natural gas would be stored on the plant site, and the flow of gas would be monitored by pressure and flow sensors. The natural gas supply to the plant would be automatically shut down by block valves in the event of a natural gas release. No gaseous hazardous chemicals in large volumes are stored at the plant, and therefore, chemical releases that could travel outside the plant buildings or fenced area are not expected. The plant would be equipped with internal fire fighting capabilities (water, personnel), and response times from the nearest emergency response forces (Hermiston Fire Department) is 10 minutes or less.

As discussed above, the Wanapa Energy Center is buffered by more than a mile in all directions from inhabited structures, or public roadways.

In summary, the potential for power plant accidents resulting in fires or releases is very low, based on the internal operational controls. The potential for injury to the public is also very low because the plant is isolated from the nearest occupied structures by more than 1 mile.

3.11.2.2 Natural Gas Pipeline

The gas pipeline would be constructed along a 10-mile corridor from the Northwest Stanfield Compressor Station to the proposed facility. The land use in the construction corridor consists of mixed use and includes agricultural, residential and vacant land.

During construction and operation of the pipeline, there are several potential impacts to public health and safety.

Gas Pipeline Construction Safety Risks

During construction and installation of the pipeline, there is potential for fire and injury due to use of heavy equipment, working in trenches and working with large material components. Directional drilling also would be utilized in certain locations to minimize surface disturbance. There also are potential safety issues associated with increased traffic on access roads and the movement of heavy equipment to the construction corridor.

Contractors that conduct construction activities would be required to develop and implement health and safety plans that address all on-site activities. These plans would include specific procedures for safely conducting any activity with significant safety risks. All contractor employees would receive initial health and safety training before starting work and periodic training updates throughout the project. Emergency response and first aid procedures also would be established and all employees would be trained on their implementation. At the end of every workday, the contractors would secure all construction areas to protect equipment, materials and the public. Fueling of highway authorized vehicles would be conducted off-site. Fueling of construction vehicles would be conducted according to established procedures that minimize fire risks. Only trained personnel would be permitted to conduct high-risk operations such as directional drilling and all other personnel would be required to maintain a safe distance from such operations.

All construction sites would maintain firefighting equipment such as extinguishers and spill response equipment. Vegetation would be cleared from construction sites to prevent contact with fire ignition sources such as vehicles and construction equipment. All construction activities would be conducted according to applicable USDOT, Occupational Safety and Health Administration, and state regulations.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Gas Pipeline Operational Public Health and Safety Risks

As far as potential risk to environmentally sensitive areas, natural gas releases are expected to have limited adverse effects on the environment due to the physical properties of natural gas. Methane, the primary component of natural gas, is colorless, odorless and tasteless. Methane is a naturally occurring product of anaerobic fermentation and is commonly found as an emission from wetlands.

Once released, methane rapidly volatilizes (evaporates) into the atmosphere. While methane is not toxic, it is classified as a simple asphyxiant which means that if breathed in high concentrations, it can cause oxygen deficiency. Because natural gas does not bioaccumulate, is non-toxic and disperses rapidly into the atmosphere, toxicological effects to environmentally sensitive areas would not be expected.

However, natural gas does pose a physical hazard. The greatest hazard to public safety from a major pipeline rupture would be a fire or explosion. Methane has an ignition temperature of 1,000°F and is flammable at concentrations between 5 and 15 percent in air. A flammable concentration within an enclosed space in the presence of an ignition source could explode. However, unconfined mixtures of methane in air are not explosive.

To evaluate the potential hazard to the public, it was determined that there are 16 residences within 200 feet of the pipeline route. Using the risk probabilities for natural gas pipelines, the following risk values to these residences can be calculated for the life of the proposed facility:

Table 3.11-2 demonstrates that the probability of an incident involving the natural gas pipeline would be extremely low, based on historical statistics.

Table 3.11-2
Estimated Incident Rates for the Project's Natural Gas Pipeline Service Life

| Service Life | Accidents (#) | Injuries (#) | Fatalities (#) |
|---------------------|----------------------|---------------------|-----------------------|
| 30 Years Service | 0.08 | 0.01 | 0.004 |
| 50 Years Service | 0.14 | 0.02 | 0.006 |

The gas pipeline for the proposed project would be constructed according to federal standards including the Pipeline Safety Act of 1992 and the Pipeline Safety Improvement Act of 2000. Safety specifications include minimum depth cover, pipe wall thickness, design pressures, material selection and protection from internal, external and atmospheric corrosion. There also would be requirements for inspection and testing of welds and frequency of pipeline patrols and leak surveys. Before operation, the pipeline would be tested for leaks using hydrostatic test methods. The pipeline route would be marked with aboveground signs at road crossings to deter third-party damage.

Because the 10-mile route of the gas pipeline is readily accessible, emergency response would be rapid and unhindered by terrain or weather. Subsequent repairs also would be completed quickly.

The potential hazard to public safety and the environment from pipeline failures would be extremely low.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

3.11.2.3 Transmission Line Safety

Transmission Line Construction Safety Risks

During construction and installation of towers and conductor/ground wires, there is potential for fire and injury due to use of heavy equipment, working at heights and working with high voltage equipment. Connection of conductors may be done using *implosive-type fittings*, which can cause potential injury to construction workers. There also are potential safety issues associated with increased traffic on access roads and the movement of heavy equipment to the construction corridor.

Contractors that conduct construction activities would be required to develop and implement health and safety plans that address all on-site activities. These plans would include specific procedures for safely conducting any activity with significant safety risks. All contractor employees would receive initial health and safety training before starting work and periodic updates throughout the project. Emergency response and first aid procedures also would be established and all employees would be trained on their implementation. At the end of every work day, the contractors would secure all construction areas to protect equipment, materials and the public. Fueling of highway authorized vehicles and helicopters would be conducted off-site. Fueling of construction vehicles would be conducted according to established procedures that minimize fire risks. Helicopter pilots would adhere to established flight safety procedures for protecting construction workers and the general public. Notice would be provided to the public for all high-risk operations such as blasting. Only trained personnel would be permitted to conduct such high-risk operations and all other personnel would be required to maintain a safe distance from such operations.

All construction sites would maintain firefighting equipment such as extinguishers. Vegetation would be cleared from construction sites to prevent contact with transmission lines and fire ignition sources such as vehicles. Towers and lines would be constructed according to the National Electrical Safety Code and BPA procedures. BPA specifications also would be followed for grounding fences and other objects on or near the proposed ROW.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

Transmission Line Operational Public Health and Safety Effects

There would be slight additional risks for fire and injuries to maintenance workers that travel in the corridor to perform maintenance on the transmission lines. Transmission lines also represent potential for electric shocks; however, the lines are constructed and operated according to the National Electrical Safety Code and BPA procedures and are designed to minimize the risk for shock. BPA offers a free booklet that describes safety precautions for individuals who live or work near transmission lines (“Living and Working Safely Around High Voltage Power Lines” – a copy can be found in the BPA McNary- John Day Transmission Project EIS (BPA 2002) or obtained directly from BPA).

All maintenance workers would receive specific training on the appropriate procedures for equipment inspection and repairs. They also would receive first aid and emergency response training with periodic refresher sessions. Maintenance vehicles would carry fire suppression equipment and communications equipment to facilitate contacting back-up emergency response personnel.

There are four operational aspects, attributed to the electrical environment of a high voltage transmission line, which are commonly addressed in new construction: 1) radio and television interference – also known as RI and TVI; 2) audible noise; 3) electric fields; and 4) magnetic fields. Often electric and magnetic fields are generically grouped and called Electromagnetic fields (EMFs). Each of these aspects is considered below.

RI and TVI. A spark-like phenomenon called corona on the surface of high voltage conductors can create signals that may interfere with radio and television reception. Modern line designs have reduced corona to a minimum and such a design would be employed. However, occasionally, more

sensitive radios and television sets pick up the “corona” noise. BPA policy is to address problems on a case-by-case basis. Some RI and TVI situations been corrected by locating and fixing a hardware problem on the transmission line, a problem typically caused during construction.

The TRCI has expressed concern about the proximity of a new high voltage transmission line to the facility because some of the frequencies used for facility communications and security could be affected. The Institution also expressed concern about interference with the reception for AM band radio stations, to which prisoners often listen. Prediction of potential transmission line corona effects on these sources would require detailed studies. As an alternative, the BPA has estimated that a distance of 1,000 feet would be sufficient to prevent interaction between the transmission line and Institution security systems and radio reception. The proposed transmission line alignment would much farther than 1,000 feet from the Institution fence line.

Audible Noise. Corona, especially during rain, is a source of low-frequency hum (120 Hz) and crackling. Modern line designs have reduced this noise to regulatory levels. The unit of measurement for audible noise is the dBA. Oregon State regulations require 50 dBA at the edge of ROW. BPA calculations show that existing levels to be approximately 52 dBA; however, the calculation methodology does have a 2 dBA uncertainty and actual measured levels are usually less.

The audible noise calculation methodology can predict the relative effect of a new line on the existing environment. Specific calculated levels at the existing edges of ROW are 52.2, 52.3, 51.0, and 50.6 dBA. For the new transmission line, the calculated results are 52.5, 52.2, 51.4, and 50.8 dBA. These differences are undetectable to the human ear. Also note that one level slightly decreased; this is because the location of the edge of that ROW changed due to the position of the new line.

Electric fields. These fields are a function of line voltage, line design, and distance between the conductors and ground. The chief effects can be nuisance shocks to humans on the ROW. Oregon State limits the level to a maximum of 9 kV/m on the ROW. Under conditions of maximum conductor sag (minimum clearance) the levels on the new ROW would not exceed that limit.

Magnetic Fields. These fields are generated by line currents that can be quite variable depending on electrical loads through the system. Thus, magnetic fields depend on the time of day and the season. There is no simple methodology to predict levels at any particular future instance in time.

However, experience has shown that peak levels are the most predictable. These peaks will occur when all involved lines have maximum currents flowing. If the new line were not built the calculated peak magnetic fields at the edges of ROW would be 18.4, 6.3, 61.1, and 61.4 milligauss (mG) - (estimated predictions for 2004). Effect of a new line would be 21.2, 74.3, 45.5, and 45.2 mG at those same locations.

The only residential areas located in the vicinity of the proposed new transmission line is the north-south 1 mile segment parallel to Highway 395 where the new transmission line would be constructed. The existing Lower Monumental–McNary circuits would be re-located on the new structures; the Wanapa–McNary transmission line would be attached to the existing Lower Monumental–McNary structures (see **Figure 2.3-8**). It was estimated from aerial photo interpretation and ground reconnaissance that 10 occupied residential structures are located adjacent to Lind Road between the existing Lower Monumental–McNary transmission line and the proposed transmission line segment (see **Figure 3.9-2**). The non-ROW area between the new transmission line and the existing Lower Monumental–McNary 500 kV transmission line varies from about 250 feet wide to 550 feet (a somewhat triangular shape). Variation of magnetic field in this area is best described in chart form. The following figures (**Figures 3.11-1** and **3.11-2**) show plots of predicted magnetic fields in the non-ROW area as well as on the ROW.

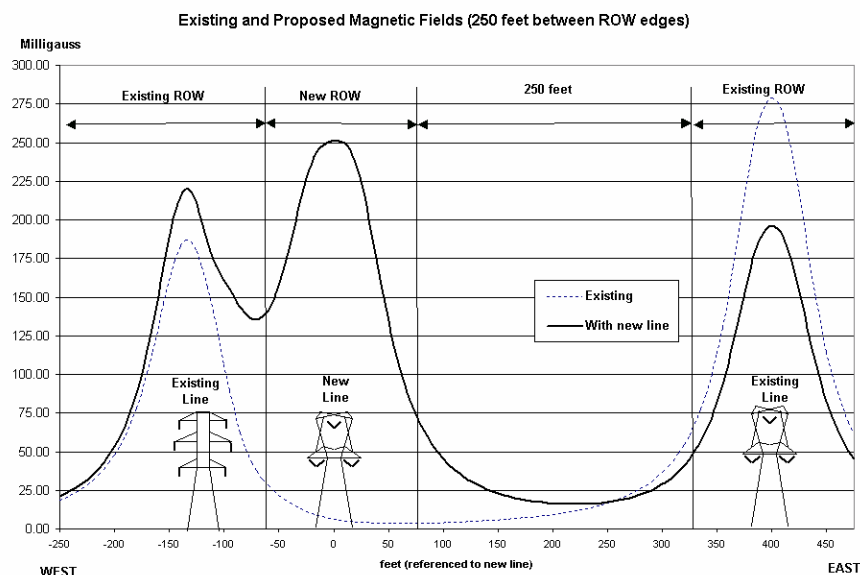


Figure 3.11-1 Existing and Proposed Magnetic Fields (250 feet between ROWs)

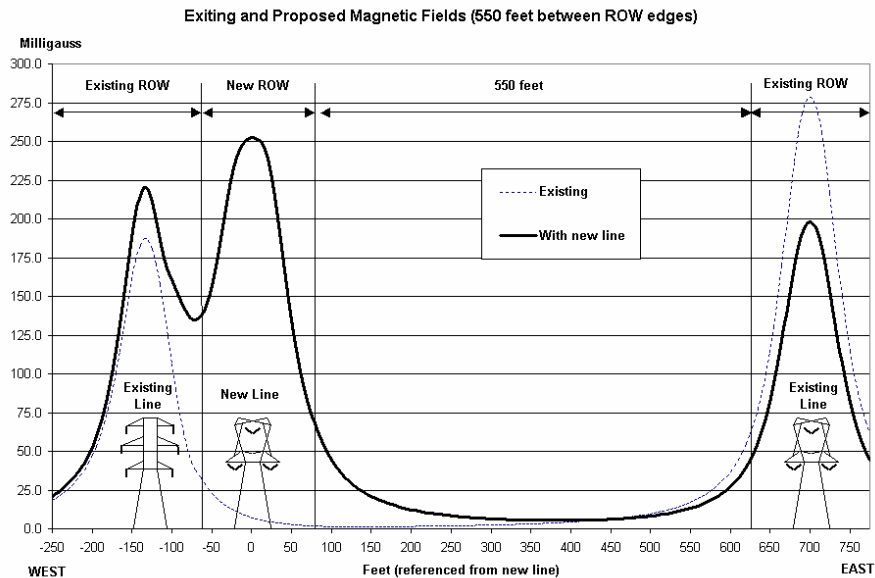


Figure 3.11-2 Existing and Proposed Magnetic Fields (500 feet between ROWs)

The net result is a reduction of the magnetic fields on the eastern one-third portion of the area between the ROW edges, as well as under the existing Lower Monumental–McNary 500 kV line. Magnetic fields would be increased in the vicinity of the new line and in the western two-thirds of the triangular area.

Residences in the area of increasing magnetic fields may have problems with TV pictures and computer monitors – the degree of disturbance depends on exact location. Liquid crystal display monitors are not affected.

Over the past two decades, much research has been completed regarding the health effects of magnetic fields. Some studies have reported increased risks for cancer; other studies were negative. The general opinion is that there is a lack of evidence supporting the health effects, and, if there are effects, they are difficult to establish. BPA has adopted the stance taken by the National Institute of Environmental Health Science (NIEHS) and advises those interested in the subject to locate the

NIEHS website and the related site called EMFRAPID. The available information is extensive. BPA suggests reviewing the summaries which essentially state the NIEHS position.

All structures, conductors and lines would be constructed according to the National Electrical Safety Code and BPA procedures – electric and magnetic fields that would be produced would not exceed standard levels of exposure for this type of transmission line and distances to receptors.

Recommended Mitigation Measures. No measures beyond those included in the proposed project are recommended.

3.11.3 Impact Summary

The potential impacts to public safety and health would be minor. During construction of the **power plant**, transmission lines, and gas/**water** pipelines, good engineering practices and standard safety procedures would be implemented to protect construction workers and the general public. The new transmission line would be located adjacent to existing transmission lines and those residences and buildings already in close proximity to existing lines could experience a slight increase in exposure to electric and magnetic fields. Residences, buildings and people in the vicinity of the gas pipeline would be exposed to a minor risk for pipeline incidents such as leaks, fires or explosions. However, over the 30 to 50 years of expected service life of the pipeline, the projected incident rate for accidents, injuries or fatalities is 0.014 or less. The pipeline would be regularly inspected and tested according to industry standards to minimize the potential for incidents.

3.11.4 Component Alternatives Comparison Summaries

The consequence of an accidental pipeline natural gas release and fire is dependent on the number and proximity of residential and commercial structures to the pipeline. The Proposed Action would pass within 200 feet of 16 residences. Fewer residences would be located along Alternatives 1, 3, and 4 where the routes are located further away from county roads. The pipeline would pass within 200 feet of more residences along Alternatives 2, 5, and 6 (43, 42, and 44 residences, respectively) because these gas pipeline alternatives are located within county road ROWs, or cross densely settled areas. Many residences are located next to county roads because utilities (water and electrical power) are located along these roads. Gas pipelines buried in the same ROW as other buried utilities (e.g., water, telephone cable) along roads may

experience a higher risk of accidental excavation damage by third parties. Natural gas pipeline location signs would be required by utility and safety agencies.

Based on an evaluation of existing and proposed magnetic fields associated with transmission lines routed parallel to Lind Road, it is estimated that 10 residences that are located within about 300 feet from existing and proposed transmission lines would be exposed to slight increases in electrical and magnetic fields if the Proposed Action or Alternative 1 were constructed or operated. No residences would be exposed to increases in electrical and magnetic fields if Alternatives 2 or 3 were constructed because they would be installed in a new ROW with no existing transmission lines, and would be located away from residential areas.

3.12 Summary of Mitigation Measures

Table 3.12-1 summarizes the mitigation measures discussed in this section.

Table 3.12-1
Summary of Mitigation Measures

| Resource | Mitigation Measure |
|-----------------------|---|
| Soils | |
| | S-1: Restrict construction traffic to the defined ROW. |
| | S-2: Restrict the pipeline construction ROW width to 75 feet in the Wanser loamy fine sand and Winchester sand units where the natural gas supply/ <i>plant</i> discharge <i>water</i> pipeline route crosses native vegetation communities. |
| | S-3: Use measures such as topsoil matting, planting of cover crops, or soil binder in the Wanser loamy fine sand and Winchester sand units along the southern portion of the natural gas supply/ <i>plant</i> discharge <i>water</i> pipeline routes to reduce wind erosion. |
| | S-4: Segregate the stripped topsoil separately from the trench spoil; |
| | S-5: Remove all excess large-size rock from the upper 12 inches of the soil to the extent practical in agricultural and residential areas. |
| | S-6: Excess pipeline trench rock would be placed in a landowner-approved location. |
| Vegetation/Land Cover | |
| | VLC-1: The revegetation mixture applied to disturbed soils on the Wanaket Wildlife Area would conform to the future management objectives for the site as described by the Wildlife Area Management Plan (CTUIR and BPA 2001b). |
| | VLC-2: A pre-construction weed inventory would be completed along the approved pipeline route to determine the location of weed populations within and adjacent to the construction ROW. Excavation equipment would be cleaned (air pressure hoses, or wash stations) after crossing weed infestation areas and entering weed-free areas. All soil excavated from weed-infested areas would be replaced in the same location. |
| | VLC-3: Any hay used as mulch would be certified as weed-free prior to application. |
| Wildlife | |
| | W-1: Prior to construction activities during the raptor breeding season (March 1 - June 30), breeding raptor surveys would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any potentially active nest sites within 0.5 mile from the project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas would be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures <i>would</i> be implemented on a site-specific and species-specific basis, in coordination with CTUIR and Wanaket Wildlife Area biologists. |
| | W-2: Standard, safe designs as outlined in Mitigating Bird Collision with Power Lines (APLIC 1994) would be incorporated in the design of the electrical distribution lines to prevent collision to foraging and migrating bird species with the project area, in coordination with CTUIR and Wanaket Wildlife Area biologists. Design features would include the configuration of the route to avoid partitioning foraging and resting habitat, alignment of overhead groundwire to the same height as the conductors, and the use of markers to increase the visibility of the lines to birds. |

Table 3.12-1 (Continued)

| Resource | Mitigation Measure |
|-----------------------------|---|
| Wildlife (continued) | |
| | W-2: Standard, safe designs as outlined in Mitigating Bird Collision with Power Lines (APLIC 1994) would be incorporated in the design of the electrical distribution lines to prevent collision to foraging and migrating bird species with the project area, in coordination with CTUIR and Wanaket Wildlife Area biologists. Design features would include the configuration of the route to avoid partitioning foraging and resting habitat, alignment of overhead groundwire to the same height as the conductors, and the use of markers to increase the visibility of the lines to birds. |
| | W-3: Prior to construction activities during the avian breeding season (March 1 - June 30), avian breeding surveys for long-billed curlew, grasshopper sparrow, loggerhead shrike, and western burrowing owl would be conducted by a qualified biologist through areas of suitable nesting habitat to identify any potentially active nest sites within 0.25 mile from the project area. If applicable, appropriate protection measures, including seasonal constraints and establishment of buffer areas would be implemented at active nest sites until the young have fledged and have dispersed from the nest area. These measures would be implemented on a site-specific and species-specific basis, in coordination with CTUIR Wanaket Wildlife Area biologists. |
| | W-4: Prior to construction activities through suitable breeding habitat for special status reptile and amphibian species, occurrence surveys for western painted turtle, western toad, Woodhouse's toad, and northern leopard frog would be conducted by a qualified biologist to determine presence. If present, appropriate protection measures could include rerouting the pipeline ROW to avoid breeding habitat, in coordination with CTUIR and Wanaket Wildlife Area biologists. |
| Transportation | |
| | T-1: Implement partial plant site shift changes to reduce the number of personal vehicles that queue at the Beach Access Road/U.S. Highway 730 intersection. |
| | T-2: Time major construction material deliveries to off-peak hours (early morning, late evening) to prevent local congestion on U.S. Highway 730. |
| | T-3: A site-specific construction traffic flow plan would be submitted to the Oregon DOT that documents the present traffic volumes, expected volume of project construction traffic, and the intersections to be used. If warranted by this study, the width of the U.S. Highway 730 at the Beach road intersection (or other intersections) would be expanded to provide left-hand and right-hand turn lanes. |
| Cultural Resources | |
| | <i>C-1: Upon concurrence from the SHPO/THPO, adverse effects to three NRHP – eligible elements (A-line Canal, the Feed Canal, and the Furnish Ditch) would be avoided by horizontally boring under these features rather than trenching through them.</i> |
| | <i>C-2: The CTUIR Cultural Resources Protection Program (CRPP) considers the Wanapa Energy site to be a Traditional Cultural Property (TCP). Therefore, the CRPP would: 1) ensure that a CRPP Tribal Monitor is present during all ground disturbing activities; 2) the CRPP would be consulted throughout the entire planning and construction process until the project is completed; and 3) the CRPP would participate in appropriate mitigation planning to maintain traditional uses of the site and/or develop appropriate mitigation plans, as necessary.</i> |